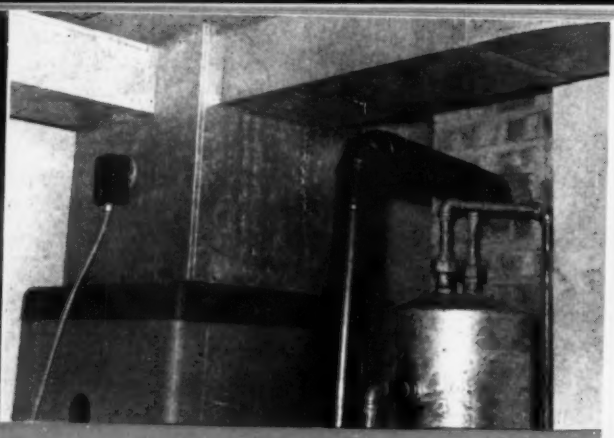
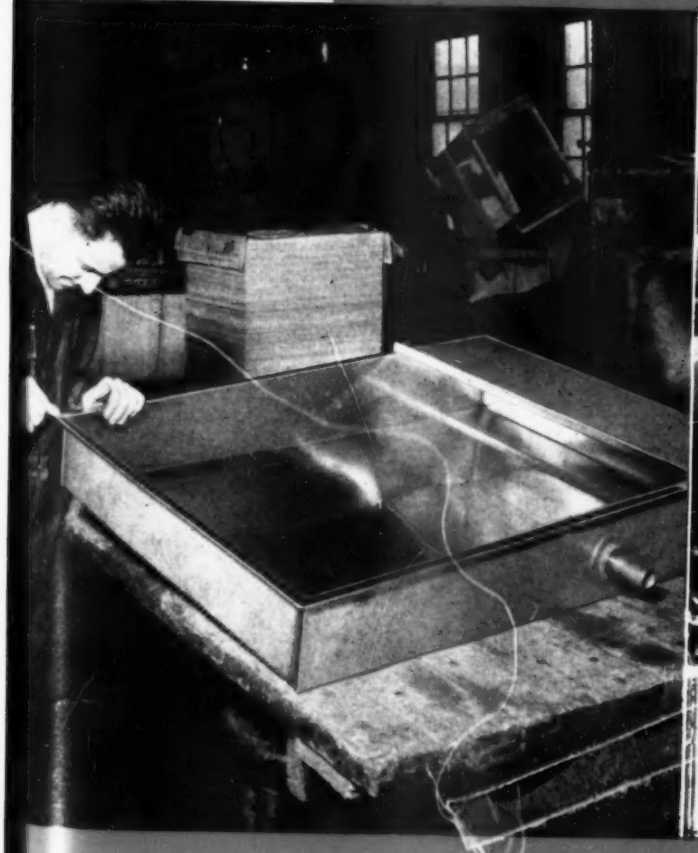


AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING--SHEET METAL CONTRACTING



SEPTEMBER, 1947

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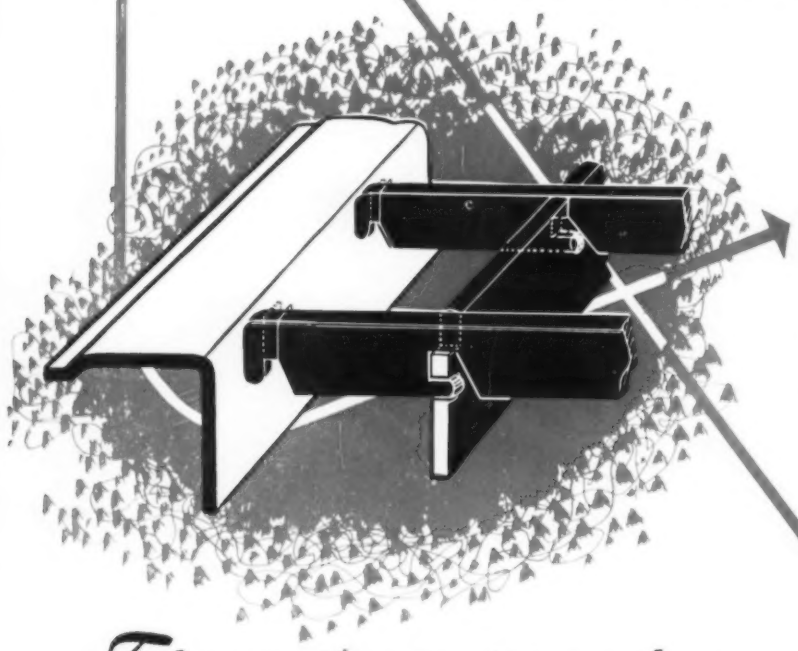
Back Again!

AIR CONTROL FLOOR REGISTER WITH RIGID-LOCK* FRET



Air Control Products, Inc. proudly announc the return of the outstanding No. 40 Seri Floor Registers — with the improv RIGID-LOCK construction. For several ye this popular register was not available — i creased deliveries of strip steel have now ma it possible to put this floor register back in production. Built of heavy gauge steel fr — locked together into one solid integ unit — this stronger, better looking regis is tops in quality. Supplies are limited, b your AIR CONTROL Jobber will soon be a to supply your needs.

This is RIGID-LOCK *fret Construction*

*

Rigid-Lock Construction locks each fret to the crossing fret and each fret to the margin — an outstanding improvement that means exceptional strength and a perfectly flat walking surface.

*

Medium Mesh — *one* fret spacing ($^{7}/_{16}$" between frets) that has ample free area yet is "heelproof". You no longer have to stock both wide mesh and narrow mesh floor registers and faces.

*

Infra-Red Baked Finishes — the best paints available — baked by the famous infra-red process assures the finest of durable, long life finishes.

No. 40 FLOOR REGISTERS

No. 41 RETURN AIR FACES

Manufacturers

AIR CONTROL — Air Conditioning Registers and Grilles — G av
LEIGH Building Products

AIR CONTROL PRODUCTS, I

COOPERSVILLE MICHIG

HOTTEST NUMBER
in the Replacement Field

Herbert the Hare says: "*You Can Play a Song of Sweet Profits on the New Wilson's Honeycomb Hair-Filters*"!

Watch "Herbert the Hare," he's going places.

Yes, sir—the Double-Layer construction and Double Filter action of Wilson's Natural H*air* Filter sure pays dividends to dealers.

Only Wilson's H*air* Filter gives the amazing cleaning action of natural hair, oil processed. Homeowners—especially the women—like the trim-looking, clean, easy to handle honeycomb casing. It's the most popular and salable replacement unit in the field.

"Herbert the Hare" is going places and he's taking alert dealers along with him to a nice profitable filter business. Why not go along?

FREE SAMPLE with details and prices upon request.

MEMBER INDOOR COMFORT

Wilson & Co., Inc. (Air Filter Division)
4100 So. Ashland Ave., Chicago 9, Ill.

WILSON & CO. INC

Western States Representatives:—HAROLD WINNINGHAM & COMPANY • SEATTLE • SAN FRANCISCO • LOS ANGELES • SALT LAKE CITY • DENVER • EL PASO

WILSON'S HAIR FILTER

AMERICAN ARTISAN

with which are merged FURNACES & SHEET METALS — Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

John E. Peterson, Editor
John McCullough, Associate Editor A. A. Kennedy, Assistant Editor

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In This Issue

A LARGE number of people in business probably believe that budgets are like women—"their place is in the home." And yet a budget can play a very important part in the conduct of any business, particularly during times of such incalculable stress and dislocation as at present. The article on this subject that you will find on Page 62 gives an excellent picture of the place of the budget in planning and an idea of some of the results that can be expected from its use.

•

It is always a pleasure for us to present material such as that on pages 71 and 80. Justification for that rather bald statement may be found in the fact that the first named article is one describing an installation of electronic precipitators in a warm air system and we regard that as an excellent addition to winter air conditioning, in view of results achieved in elimination of dust and bacteria (by the Sterilamps).

•

The second is the "Case History" of a heat pump installed in the city of Indianapolis and we think the heat pump has a sales potential the warm air heating industry can exploit since it features air circulation. It certainly offers a tremendous stride toward the goal of complete **Indoor Comfort**, summer as well as winter.

•

An interesting new series starts on Page 94—"Design of Waste Removal Systems.' Based on lectures in a sales engineering school these articles will present much basic theory as well as practical applications.

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Founded 1880

SEPTEMBER, 1947

Volume 116, No. 9

Old Man Oil Shortage

Won't Bother You If You Install

SYNCROMATIC

America's BEST FURNACE CAN BE EFFICIENTLY OPERATED ON **COAL** UNTIL **OIL** IS AVAILABLE

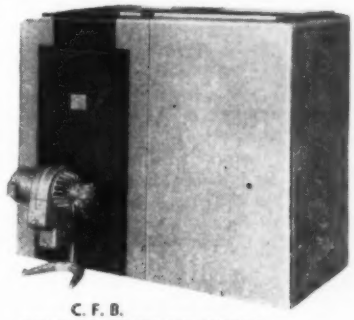
Syncromatic's **"HEAVYWEIGHT"** *AND IS HE TOUGH!*

● CONVERSION FROM **COAL** TO **OIL** CAN BE EASILY ACCOMPLISHED AT SMALL COST AND WILL GIVE YOU AN OIL FURNACE SECOND TO NONE IN LOW OPERATING COST

C. F. B. SERIES
COAL HAND-FIRED
FORCED AIR

Note:

HAVE YOUR CUSTOMER KEEP HIS GRATES AFTER HE HAS CONVERTED TO OIL IN CASE SOME DARN FOOL TALKS ANOTHER OIL SHORTAGE



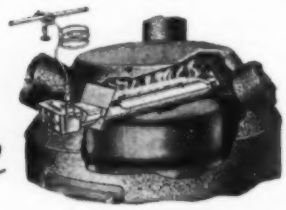
C. F. B.
CONVERTED TO OIL FIRING

Syncromatic Corporation

WATERTOWN, WISCONSIN

YOU CAN DO *a lot of*

Showing completed installation of a "ZEPHYR" Bronze Humidifier in a sloping bonnet furnace.



HUMIDIFIER BUSINESS

Patented Wing Deflectors and Pan Construction.

with this* MAID-O'-MIST *"Zephyr"

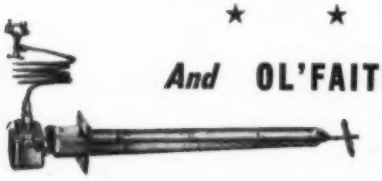
Take a few seconds—and note the unique design of our Maid-O'-Mist Automatic Zephyr.

Note particularly the wing deflectors (patented feature) which CONVERGE and DIRECT heated air over the water surface. *Rate of evaporation is thus extremely high—the humidifying capacity extremely large.* A big selling point with home owners.

Humidifier pan is stamped from corrosion-resisting bronze metal—you can guarantee long, trouble-free service. Nothing half-good or shoddy about the Maid-O'-Mist Zephyr!

Two sizes (26″ and 36″ pans) enable you to care for all jobs, either straight or sloping plenum furnaces.

★ ★ ★



***And* OL'FAITHFUL BRONZE HUMIDIFIER**

Same efficient design and corrosion-resisting construction as the Maid-O'-Mist Zephyr Humidifier, but furnished without patented wing deflectors and the adjustable back plate.

★ ★ ★

SEND TODAY for DEALER Prices and Discounts

Aside from humidifiers, Maid-O'-Mist manufactures Humidifier Valves and other high-grade Heating Specialties. To be a Maid-O'-Mist dealer proves mighty profitable. Write us for full particulars, or see your jobber.

MAID-O'-MIST INC.

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

3213 N. PULASKI RD.
CHICAGO 41, ILLINOIS

The Editor's NOTE BOOK

Warm Air Panel Heating

American Artisan:

I should like to have information on this radiant heating problem—passing warm air through a hollow concrete floor.

I intend to build of concrete blocks . . . Floor construction will be a slab of haydite on earth with 2 by 6 in. concrete joists laying on the slab. Corrugated iron will be laid across the joists to support the floor slab. Warm air is to circulate through the joists.

O. A. J., Calif.

Reply:

We are sending you a reprint of three articles published in American Artisan last year and tear sheets from our January, March and April 1947 issues. Four of the articles describe warm air panel systems in conjunction with a slab, one being almost identical to the construction you describe except that warm air is discharged into the rooms. Another describes basic principles of panel heating, and the other, suggestions for improved slab construction.

When the present series of panel heating articles is completed, we propose to reprint them in booklet form. The booklets will be available to our readers.

American Artisan.

Bovine Comfort

"Air conditioning" cattle cars by use of aluminum paint to reflect the sun's rays, is an example of one Western railroad's effort to increase bovine comfort.

The idea is that shipping cattle in an overheated car causes shrinkage—the same as sending "the Missus" to a slenderizing salon. The aluminum paint on the top and ends of the car is said to keep the inside 5 to 10 degrees cooler. That means more weight for the cattle shipper, and more dough!

The American System

Maybe the word about how free enterprise does things is getting around the world after all! Seems that it takes about two weeks to get clothes back from the cleaners in Sweden, and with exhorbitantly high prices to boot. They are solving the problem by sending their clothes by airplane to be dry-cleaned in the U. S. Get them back in a week!

Billions of 'Em!

Speaking of bureaucracy and whither-are-we-drifting, the Federal government sends out 1,000,000,000 (1 billion) forms and questionnaires each year to its citizenry and business institutions—and expects answers back! It's called, among other things, red tape!

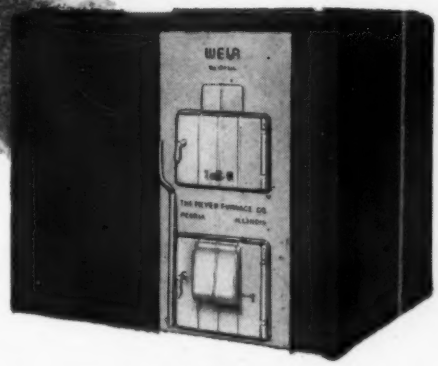
New Features with exclusive sales appeal!

MODERN WEIR 'U' SERIES STEEL FURNACE

Sell the advantages of new Integral Heating Element* plus these time-tried exclusive Weir features!

**Pat. applied for*

- Riveted and welded construction
- Inside protecting collar
- More efficient radiator
- Curtain prevents smoking
- Finger-touch door latch
- Refractory brick fire pot
- Piano-type hinges
- Duplex grate with waist-high shaker
- Surface ground doors and seats



DRUM, POUCH AND DOOR SEATS ALL ONE PIECE

With the first major coal-fired furnace improvement in years, WEIR 'U' Series gives you powerful and exclusive sales appeals. You can sell amazing new cleanliness because it's permanently leak-proof! Greater efficiency and finer performance, too. Installation is simpler and easier. Steel front slides over Integral Heating Element* and casing hooks tightly to it. Write for franchise details.

THE MEYER FURNACE COMPANY

Manufacturers of
Weir and Meyer furnaces, Air Conditioners for Oil, Gas, Coal.
General Offices: Peoria 2, Illinois — Factories: Peoria and Peru, Illinois

Weir 'UC' Series Air Conditioner provides all the advantages of 'U' Series furnace with Integral Heating Element plus rectangular casing of modern design for air conditioning.*

WEIR-MEYER means modern heat

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

Gas-fired Hi-boy · Gas-fired Air Conditioner · Gas-fired Gravity · Oil-fired Hi-boy · Oil-fired Air Conditioner · Weir Steel furnace · Coal-fired Air Conditioner · Industrial & commercial heating equipment

ROYAL JET-FLOW

Out-performs heating units costing three times as much

Jet-Flow is new . . . different . . . easy to sell . . . easy to install. A real profit maker . . . summer or winter. *Royal* Jet-Flow gives advantages of forced air circulation, plus ceiling radiation—truly two-way heating. Cost no more installed than conventional wall heaters or floor furnaces. Ideal for tract work.

SEND COUPON TODAY

ROYAL HEATERS INC., 1024 Westminster Ave., Alhambra Calif.

Please, send me, without obligation. Results of comparative heating tests; specifications and prices of Royal Jet-Flow.

NAME _____

ADDRESS _____

CITY _____ **ZONE** ___ **STATE** _____

AA947

The Editor's NOTE BOOK

Intelligent Labor Relations

The Sawhill Manufacturing Co. has a long record of good relations with its employees. The record was established through consistent and intelligent relations with employees, chief idea being to keep the employees thoroughly acquainted with the basic problems of management. The following relations letter may have several features which other employers may adopt:

TO OUR EMPLOYEES:

Because of the increased "cost of living," we have just submitted a proposal to the Collective Bargaining Committee of our Union to the effect that we will increase the hourly wage rates paid to employees in our plant 12½c per hour—effective from April 1, 1947.

As our contribution to the stabilization of our national economy, and in the interest of preventing the continued spiraling of wages and prices, we will endeavor to absorb this wage increase without any increase in the selling price of the material which we produce.

However, any increase in our cost for steel pipe, or further demands of any nature upon us by our Union which would increase our production costs, undoubtedly would make it impossible to maintain this policy.

We sincerely hope that our employees will recognize the individual benefits we will all attain through the stabilization of prices, and join with us in an all-out effort to cut costs through increased production. The only real source of wages is production, and there is still no substitute for work.

The real source of production in our plant, which in turn results in wages for our employees, comes from the orders we receive from our customers. We, therefore, hope that our employees recognize, as we do, that "our customer" must be considered at all times.

In the ultimate, we are all customers buying one thing or another, so isn't it about time we all join together in a serious effort to stabilize prices for the benefit of all of us?

We feel certain that our employees will cooperate with us in this program, and we know they join with us in expressing our appreciation for the fine consideration we have received from "our customers."

Yours very truly,

THE SAWHILL MANUFACTURING COMPANY.

Action When Needed!

Sampsel Limit Controls act automatically to prevent dangerous overheating that wastes fuel and injures heating plants. Easily installed on 2 or 3 wire high or low voltage systems as either regular or reverse acting controls. For all heating plants, new or replacement. Write for details.

HOT WATER LIMIT CONTROLS

Immersion-type, Back-angle (WL506). Horizontal mounting. Maintains water temperature in range of 120° - 220° F. Differential is easily adjustable.

Immersion-type, Straight-stem (WL505). Designed for vertical mounting. Adjustable differential of 10° - 20° F. Operating range of 120° - 210° F.

Strap-on type (WL507). Easily installed strap-on type clamps to hot water pipe. Variable operating range of 120° - 220° F. but differential is fixed.

STEAM LIMIT CONTROL

Pressure-Type (SL504). For low pressure systems. Operates in range 1 to 12 lbs. Vertical mounting. Maintains pressure differential of ¾ to 5 lbs.

WARM AIR LIMIT CONTROLS

Standard Limit (S48). Controls fan or operates as limit. Variable operating range of 50° - 540°. Simply adjusted differential range of 10° - 90° F.

Combination Fan-Limit Control (AF500). Automatically limits and regulates heat, controls fan. Adjustable independently. For all furnaces with blower.

There is a complete line of precision-built Sampsel automatic controls. Write for catalog.

Sampsel Time Control, Inc., Spring Valley, Illinois
Canadian Sales Distributor: Pease Foundry Co., Ltd., Toronto 1

Sampsel
AUTOMATIC CONTROLS

THARCO IS BEST

Tharco Asbestos Furnace Cement provides a high degree of adhesion and heat resistance. It never shrinks, checks or powders when properly applied. Tharco seals both sides of the joint, making it gastight and smokeless, yet it allows for all normal expansion and contraction. Scientifically compounded of the finest materials, by the secret Armstrong formula, Tharco is pronounced the best furnace cement by men who know.

FOR NEW FURNACES

Leading furnace manufacturers use and recommend Tharco Asbestos Furnace Cement because they know they can depend upon it to measure up to the high standards of their products.

FOR FURNACE REPAIR

Skilled furnace repairmen everywhere like Tharco Asbestos Furnace Cement because it works easily and because they have found that under the toughest service conditions Tharco lasts longer and gives more satisfactory results.

THARCO *Asbestos Furnace Cement*

THE ARMSTRONG COMPANY

DETROIT 17 CHICAGO 9 DALLAS 1

PRODUCED BY AN EXCLUSIVE FORMULA FOR MORE THAN 30 YEARS

The Editor's NOTE BOOK

Thanks, Mr. Sigworth

American Artisan:

We have your notice of expiration and wish to say that we are nearly 87 years old. We sold our business last August to the Forest Hardware and they should take your periodical as we think it is a very beneficial one to any organization in that line of business. We appreciated it very much and received much information from the articles pertaining to heating and the advertisements that appear in it.

Yours truly,

S. S. Sigworth,
Tionesta, Pa.

Teamwork

What have we accomplished by management-labor teamwork in this country? A Twentieth Century Fund study just issued shows that during the 80 years up to 1940 while the population of the nation increased 4.32 times, the national output of goods and services increased 16 times, made possible because the application of investment to placing mechanical energy in the hands of labor.

In 1850, animals supplied 79% of the total energy, humans 15%, and mechanical energy 6%. But in 1940, animals supplied only 6%, humans 4% and mechanical energy had jumped from 6% to 90% in 90 years.

There in a nutshell is the magic reason for America's high standard of living, the application of mechanical power to production, through investment.

The average work week in 1860 was 69 hours a week. In 1944, 41 hours a week. And yet in spite of this reduction in hours, the weekly output per worker in 1944 was 3.3 times as much as it was in 1860. The work week was shortened while the living standard went up.

The report of the Twentieth Century Fund shows that this magic of American enterprise was achieved basically because 1/5 of the national output was plowed back into business investment.

The Spark of Initiative

Freedom to profit is what impels the enterpriser to try to produce a better product than his competitor. It drives people into never-ceasing effort to surpass other people in giving the customers and users what they want, when they want it, and at a price they can pay.

Profits are the motivation—and the means—by which plants are built, tools made, products invented and developed, and jobs provided.

MONEY

Dough, Jack, Gelt, Mazuma
Spondulics, Velvet, Cabbage

No matter what you call it, Rheem offers you the opportunity to get more of it! Because Rheem offers you one of the "hottest" lines in the industry today PLUS all these advantages . . .

You make only one contact—with one source of supply—have only one credit negotiation.

You buy any part or all of a *complete* line of appliances, including range boilers, tanks, water heaters, water softeners, central heating and floor furnaces, wall heaters, consoles, stokers, attic fans, evaporative coolers.

You can buy sizes and models to fit any home—any fuel . . . oil, coal, natural, mixed, manufactured and liquid gas.

You can buy a carload assortment of items and earn Rheem's big carload discount.

You get *what* you want, *when* you want it because Rheem's 8 giant plants are geared to give you *immediate delivery.*

You can attract dealers with Rheem's unique Floor-Finance Plan that permits them to stock merchandise for a 10% investment.

You get month after month of consistent full page advertising in national magazines to create stronger consumer preference for the Rheem brand.

It all adds up to the stuff described in the big red letters above. See for yourself. Mail this coupon today . . .

Rheem

MANUFACTURING COMPANY

All Gas Appliances are approved by the American Gas Association. Electrical Appliances approved by Underwriters' Laboratories, Inc.

RHEEM
Dept. R-C6, 570 Lexington Ave., New York 22, N. Y.

Profits are my business. Tell me about Rheem.

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COMPANY .....

ADDRESS .....

CITY ..... STATE .....

ANNOUNCING
7 NEW SKIL DRILLS*
7 GOOD REASONS TO
SKILDRILL IT!
MODEL 243
1/4 in. Heavy Duty
MODEL 241
1/4 in. Special
MODEL 242
1/4 in. Standard
MODEL 244
1/4 in. Slow Speed
MODEL 253
5/16 in. Heavy Duty
MODEL 260
3/8 in. Special
MODEL 250
5/16 in. Special
● The new SKIL DRILLS you've wanted and waited for are here. They're new in design and engineering . . . in lightness and compactness . . . in drilling speed and power. New SKIL DRILLS will bring you better, faster, easier drilling and longer service on every job. Ask your distributor about a demonstration TODAY!
SKILSAW, INC.
5033 Elston Ave., Chicago 30, Ill.
Factory Branches in Principal Cities
*SKIL DRILLS are made only by SKILSAW, INC.
SKILTOOLS

The Editor's NOTE BOOK

Tax Reduction Incentive

Small businessmen will be helped in four different ways by an across-the-board tax reduction, says the Business Advisory Committee of the Department of Commerce.

First, it will reduce their tax load. On unincorporated businesses, which make up 90% of our total business world, the proprietors pay an individual income tax ranging from 19% to more than 86%.

Secondly, it will be more incentive for him to stay in business and finally, it will make available more risk capital. By risk capital is meant money that people will risk by investing in new tools, new machines and new companies, not just money invested in securities.

The higher the taxes the less incentive there is for people to invest their money in the tools and machines men work with.

Investments have built America into the strongest, most prosperous nation in the world. Investment capital provides jobs and higher wages.

An Answer For "Commies"

China's millions live in poverty because they have few "capitalists" to provide machinery to help them work. In China, you can see coolies unloading coal from boats, carrying it upstairs 500 feet, on their backs. You can see them lugging up 600 steps with water buckets biting into their backs.

American capital has made some mistakes, but it has freed most American workers from this kind of Chinese slavery. It has provided machines which make them worth more.

Before anyone starts shouting "down with capital," perhaps a little thought as to where we'd be if we were reduced to bare hands and the muscles in the arms and back and legs might not be amiss.

Profits Return to Normal

Profits in 1946 were normal in relation to the national income and in line with long-term ratios for active years, shows a recent chart survey of profits in the national economy released by the National Industrial Conference Board.

During previous years of high level employment and production, profits have averaged between 7½ and 8½ per cent of the national income. As a result of the heavy income taxes levied against corporations, profits failed to reach this normal relationship during the war years. In 1946, after the excess-profits tax was repealed, total corporate profits were estimated at 7.3 per cent of the total national income.

Now Available...

the revised

LOCKFORMER CATALOG

YOURS FOR THE ASKING

Here is a complete explanation of all Lockformer models with accessories, auxiliary rolls, Power Flangers and Easy Edgers. You'll find it interesting reading and worthy of a permanent place in your reference file whether or not you now have any Lockformer equipment. Send the coupon for your copy today.

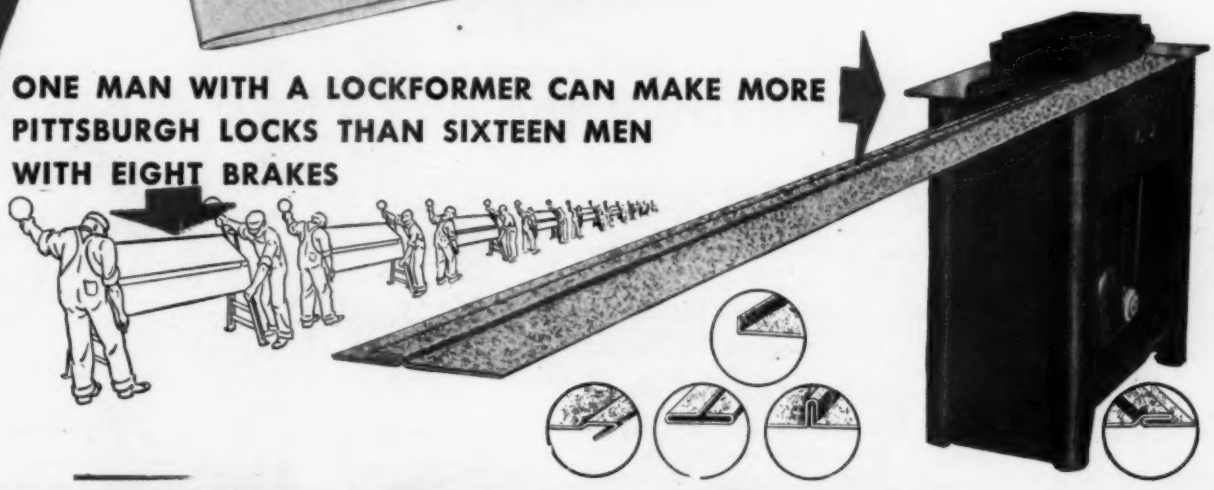
The LOCKFORMER CO., Dept. A
4615 Arthington St., Chicago 44, Ill.
Gentlemen: Please send catalog to:

Name .....

Address .....

City..... State.....

ONE MAN WITH A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES



THE LOCKFORMER CO.

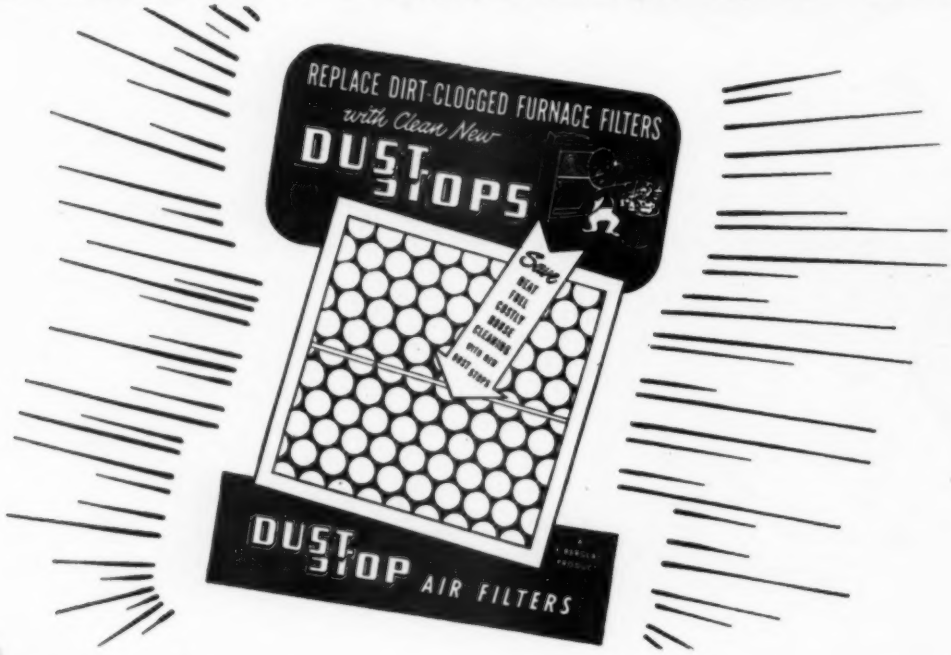
4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS

Take advantage of

the National DUST STOP* Advertising Campaign!

*T. M. REG. U. S. PAT. OFF.

Put this brand-new FREE DISPLAY to work



and get YOUR share of the Fall Filter Business

Concentrated effort on your part, together with all of the new DUST-STOP sales promotion material, provided free of charge, will pay you big dividends this Fall in the filter replacement business.

DUST-STOP Air Filters are essential to the efficient operation of forced-warm-air heating units, and replacing them is an essential part of *your* service.

Get your DUST-STOP Store Display up now where it can be seen. Use the new window streamers to attract the attention of passers-by.

From time to time, remind your furnace servicemen to check the filters on every call they make. It's a good idea to keep them supplied with blower labels—"silent salesmen" for your filter replacement service in your customers' homes.

Colorful new doorknob hangers distributed in your neighborhood will bring in some new DUST-STOP and furnace service prospects. Ask your DUST-STOP supplier about these free selling helps—today!

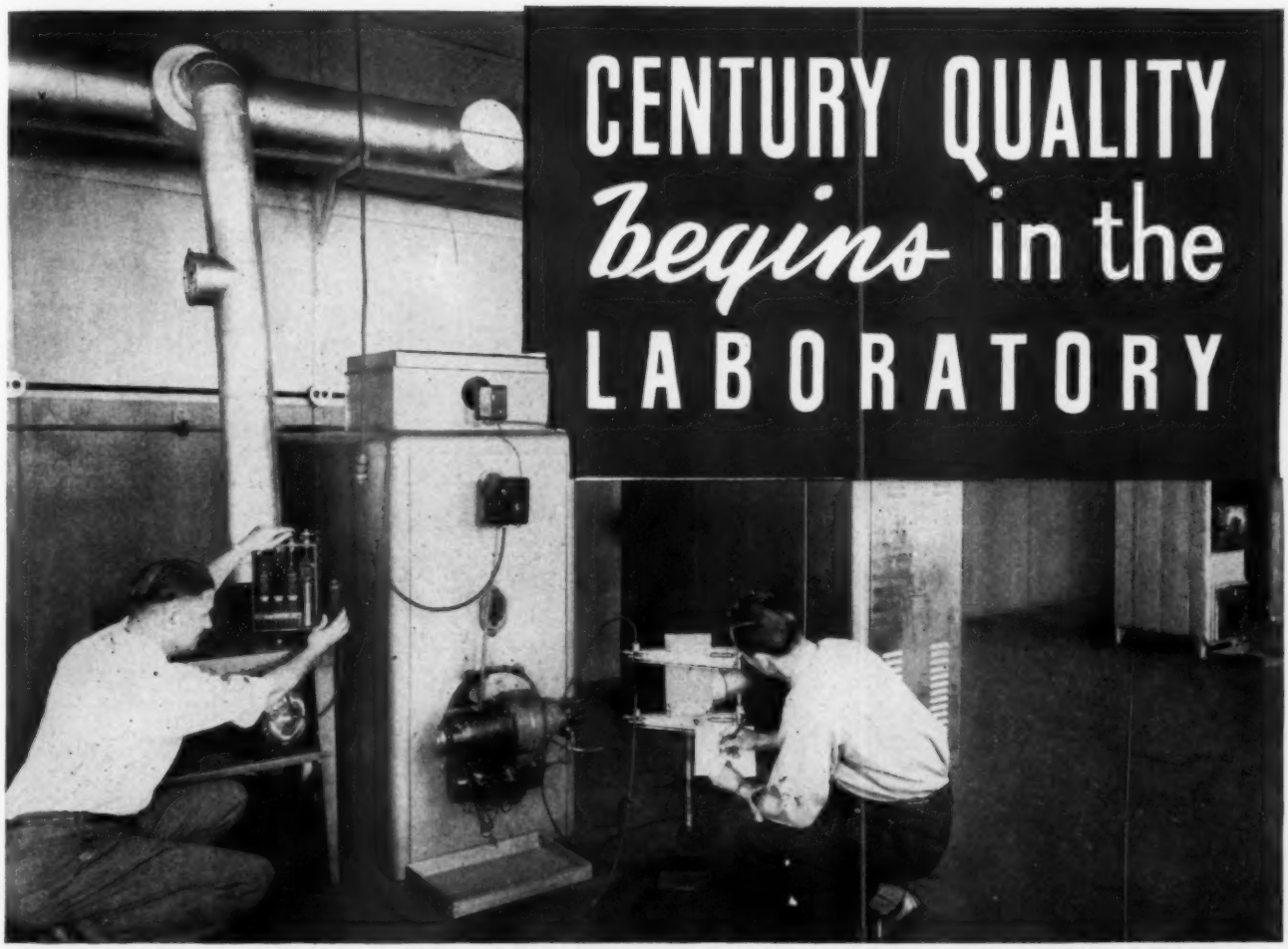
USE THIS *FREE* PROMOTION MATERIAL, TOO!

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
INDOOR COMFORT

OWENS-CORNING FIBERGLAS CORPORATION

"Your partner whose Actions speak louder than words"

CENTURY QUALITY *begins* in the LABORATORY



CO_2 Analysis and Draft Measurement Tests (shown above), and Thermo-couple checks of Shell Temperatures and Overall Efficiency Tests are a few of the many pre-production tests made in this well-equipped testing laboratory located in Century's modern, efficient plant.

MODEL "R" FURNACE UNIT—Domestic Water units and boiler burner units have been temporarily discontinued from our line due to material shortages.

CONSTANT RESEARCH AND TESTING IN OUR MODERN PLANT LABORATORY CONTRIBUTES TO DEALER PROFITS BECAUSE IT ASSURES *LOW MAINTENANCE COSTS!*

• "NEW ARRIVALS" at Century receive more than ordinary inspections before appearing in public.

Years of oil heating experience and engineering know-how are combined to produce each new unit. Only after exhaustive laboratory tests, under all possible operating conditions, are new units added to the already famous Century Line.

All this gives Century Dealers the added assurance of trouble-free operation when they install any Century Oil Furnace or Oil Burner. And dealers know that low maintenance costs mean more profits and fewer headaches for them. Inquire about a profitable Century franchise in your territory.

CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES
HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

I make a bond that's strong and fast
A metal joint that's bound to last

With many laboratory checks
And strict control I'm held to specs

With each re-order, pound or ton
My composition varies none

SO WHAT?...

Just this... I'm a Federated solder...and that means my composition is identical whether I am shipped from San Francisco in June or from Chicago in December. Uniformity in the solder you use saves production headaches.

Federated can supply you *promptly* with the best in solders—acid core, rosin core, solid wire, bar, and body. For unusual applications *any* solder can be alloyed to your specific requirements. When you need him the friendly Federated service man is ready to answer your solder questions, or help you with any non-ferrous problem. *Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, New York.*

JMLco F-H 2a

Federated first in the non ferrous field FMD

Federated METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY

Their game room becomes your display room

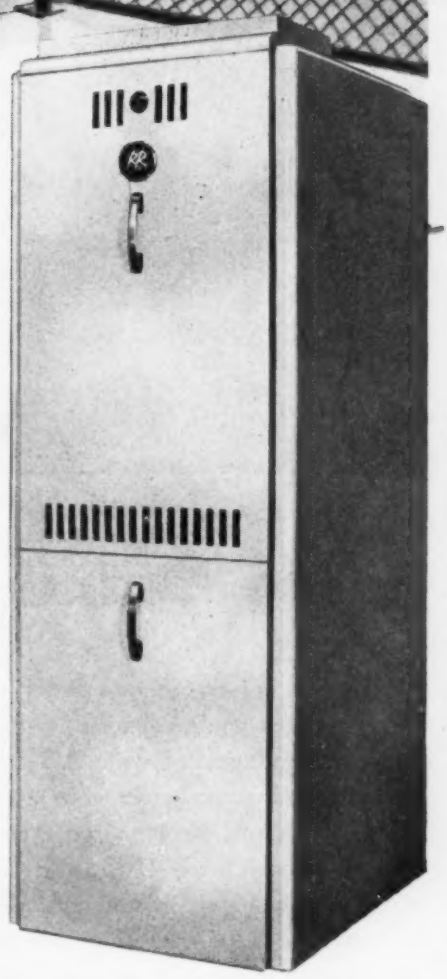
...when you install RICHMOND

THE Richmond Winter Air Conditioner attracts attention wherever it is installed. Owners like to show their friends its smart white enamel jacket. A Richmond Winter Air Conditioner never needs to be hidden because it is never dull or dingy—it uses clean gas heat.

Completely packaged, it is quickly installed. Quality-built, it reduces call-backs—assures you of full profit. Engineered for longer life, it includes the following features: Heat exchanger cast in one piece of chrome-iron alloy; Limit control to prevent overheating; Easily renewed spun glass filters; rubber-mounted blower fan.

Richmond Winter Air Conditioners are covered by *both* AGA approval and a one-year replacement guarantee. They are available in four sizes: 66,000, 90,000, 115,000, and 140,000 Btu input.

Ask your wholesaler or write us for name of nearest Richmond wholesaler. Richmond Radiator Company, 19 East 47th Street, New York 17, N. Y.



Shipped Completely Assembled

Quickly installed. Addition of special cowl converts to floor-type unit.

FACTORIES AT METUCHEN, N. J., MONACA, PA., NEW CASTLE, DEL., UNIONTOWN, PA. (2)

RICHMOND RADIATOR COMPANY

Affiliate Reynolds Metals Co.

Enameled Cast Iron Ware • Vitreous China • Perma-Glass • Gas Boilers • Gas Winter Air Conditioners • Gas Heating Furnaces • Radiators

The Brand most in demand . . .

Of course, *good steel* sheets are still hard to get. But you dealers and metalworkers who have sold and worked with U·S·S Galvanized Steel Sheets are in a better position than many of your competitors. Many of your customers, knowing how much better U·S·S Galvanized Steel Sheets are, would rather wait until you have the stock to take care of their needs properly . . . than to turn hastily to sheets of unknown quality.

Yes, this insistence on top quality, this loyalty to a dependable product helps you hold your customers during times like these . . . helps you build up a bigger business when materials are plentiful. So keep asking for these easier-to-fabricate, good-looking, long-lasting sheets. Your supplier will let you have all he can . . . as fast as he can. And may the day soon arrive when you can once again get all you want right when you want them.

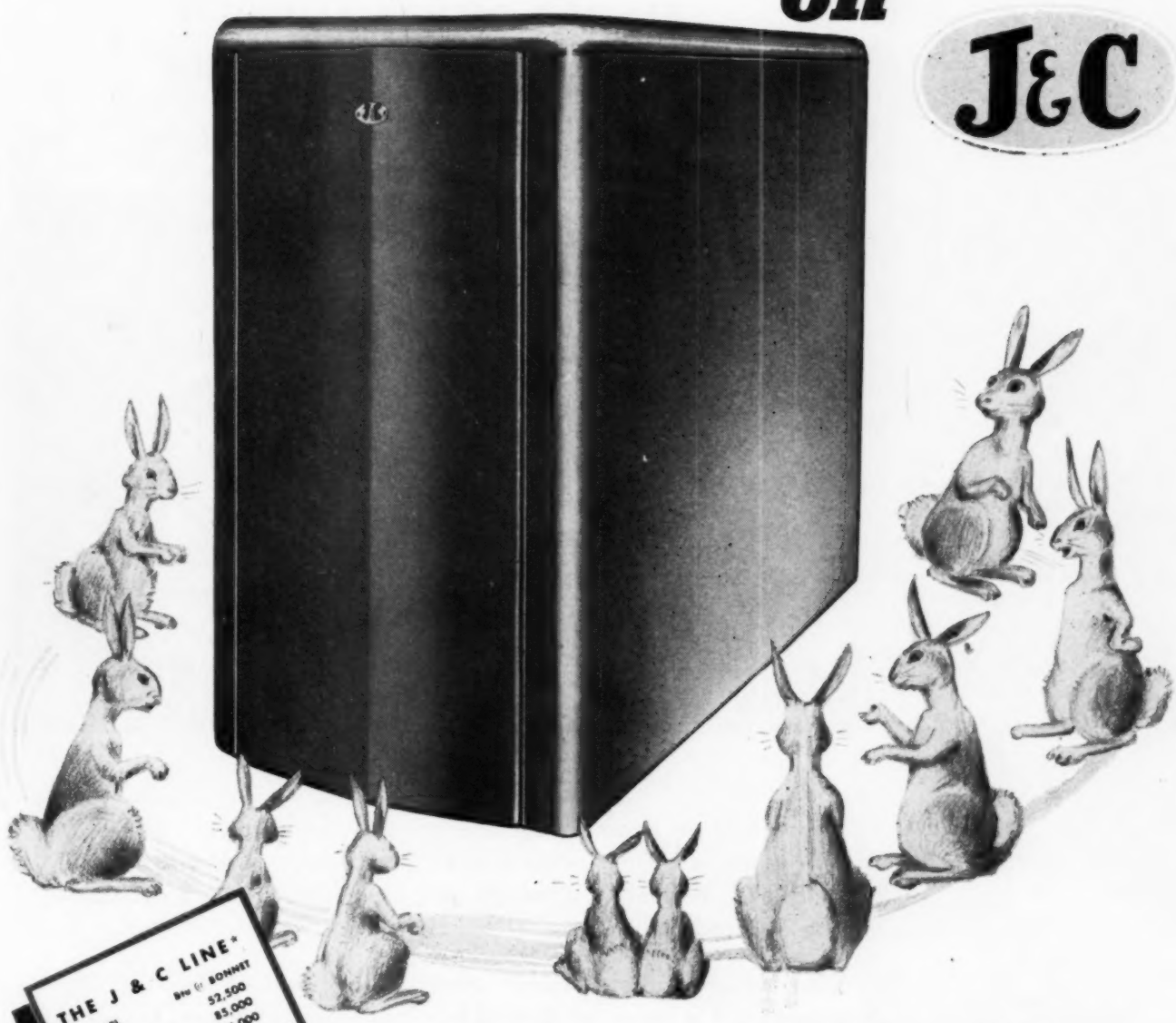
USS STEEL
UNITED STATES STEEL

U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York
7-1032

UNITED STATES STEEL

Concentrate... on J&C



THE J & C LINE*	Btu @ BONNET
MODEL	52,500
G2-70	85,000
OL3-85	104,000
G5-130	106,000
AL590	120,000
MF15	150,000
CO150	195,000
CO195	240,000
MF30	350,000
MF48	500,000
MF63	800,000
MF1000	2,000,000
CC2500	3,800,000
CC4750	

*Above are representative models in the J & C line that includes more than 100 types and sizes.

SALES . . . multiply like rabbits,—

when you handle the J & C **Complete** warm air heating **Line.**

Over 100 models for your customer's favorite fuel assures you of a profitable share of the installations for new homes, modernization, or larger buildings.

With J & C's COMPLETE COVERAGE from 52,500 to 3,800,000 Btu's you can also go after your share of the profitable drying and processing market.

A PRODUCT OF

JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN

MEMBER INDOOR COMFORT

From the cradle

HERMAN NELSON PRODUCTS SERVE MILLIONS IN AMERICA

"Whitehall"

Classroom Building at Brown University, Providence, R. I. Architects—Perry, Shaw & Hepburn, Boston, Mass. Engineer—Office of Hollis French, Boston, Mass. General Contractor—Gilbane Building Co., Inc., Providence, R. I. Heating Contractor—Joseph P. Cuddigan, East Providence, R. I.

In some of the finest college and university buildings . . . as well as modern grade and high schools all over the country . . . Herman Nelson Heating and Ventilating Products are maintaining comfortable and healthy air conditions.

Because the average man spends about 80 per cent of his entire lifetime indoors, it is important that all buildings in which he goes to school, works and plays be properly heated and ventilated.

For over 40 years, The Herman Nelson Corporation has been building quality heating and ventilating equipment for public, industrial and commercial buildings. Leading Architects, Engineers and Contractors, as well as Owners, know that the use of Herman Nelson Products will assure maintenance of desired air conditions.

herman nelson moline illinois

THE HERMAN NELSON CORPORATION

Since 1906 Manufacturers of Quality Heating and Ventilating Products

MOLINE, ILLINOIS

to the grave...

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Buffalo, N. Y.—Edward H. Cox.
Cape Elizabeth, Me.—The Partridge Co.
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Columbus, Ohio—Russell H. Smith Equipment Co.
Dallas, Tex.—W. E. Lewis & Co.
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Grand Rapids, Mich.—Marshall & Wells Co.
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ARKANSAS
Bruce-Rogers Co., Fort Smith.
CALIFORNIA
Crane Company, San Bernardino.
Dallman Supply Co., San Francisco, Sacramento.
Industries Supply Co., San Diego.
Ray-Holbrook, Inc., San Francisco, Fresno, San Jose, Sacramento, Stockton.
CONNECTICUT
Hansen Supply Co., New London.
Marsden & Wasserman, Inc., Hartford.
DELAWARE
Desco Corporation, Wilmington.
FLORIDA
Hajoca Corporation, Jacksonville, Tampa.
GEORGIA
Electric Supply Co., Atlanta.
Hajoca Corporation, Columbus, Savannah.
ILLINOIS
E. Best Plbg. & Htg. Supply Co., Quincy.
Fox Electric Supply Co., Elgin.
Hoe Supply Co., Christopher.
Inland-Peoria Supply Co., Peoria.
Inland Supply Co., Champaign, Danville, Elgin, Joliet.
Mott Brothers Co., Rockford.
Pelton-Weaver Supply Co., Springfield.
INDIANA
Baker Specialty and Supply Co., Inc., Logansport.
Evansville Supply Co., Evansville.
Industrial Supply Co., Terre Haute.
Knapp Supply Co., Muncie.
IOWA
Cedar Rapids Pump & Supply Co., Cedar Rapids.
Ewinger Supply Co., Burlington.
Globe Machinery & Supply Co., Des Moines, Cedar Rapids.
Wigman Company, Sioux City.
KANSAS
The Salina Supply Co., Salina.
The Tholen Bros. Supply Co., Leavenworth.
The Topeka Steam Boiler Works Co., Inc., Topeka.
U. S. Supply Co., Wichita.
KENTUCKY
Brock-McVey Co., Inc., Lexington.
Hoe Supply Co., Paducah.
MAINE
W. L. Blake & Co., Portland.
Carman-Thompson Co., Lewiston.
E. B. Dunning & Co., Bangor.
Hall & Knight Hardware Co., Lewiston.
Palmer Supply Co., Portland.
MARYLAND
Central Metal & Supply Co., Baltimore.
Frederick Trading Co., Frederick.
Shore Distributors, Salisbury.
Western Maryland Supply Corp., Hagerstown.
MASSACHUSETTS
Babbitt Steam Specialty Co., New Bedford.
Corcoran Supply Co., Hyannis, Brockton.
Holyoke Supply Co., Inc., Holyoke.
Charles Millar & Son Co., Springfield.
Washburn-Garfield Co., Worcester.
MICHIGAN
Bond Supply Co., Kalamazoo, Battle Creek.
Brammall Supply Co., Benton Harbor.
The Link Company, Jackson.
Michigan Supply Co., Lansing.
MINNESOTA
Marshall-Wells Co., Duluth
MISSOURI
Harry Cooper Supply Co., Springfield.
Missouri Water & Steam Supply Co., St. Joseph.
U. S. Supply Co., Kansas City.
NEBRASKA
U. S. Supply Co., Omaha.
NEVADA
J. R. Bradley Co., Reno.
NEW HAMPSHIRE
Palmer Plumbing Supply Co., Laconia, Rochester.
George E. Trudel Co., Manchester.
NEW JERSEY
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NEW YORK
W. A. Case & Son Mfg. Co., Jamestown.
John B. Davis Co., Inc., Rochester.
J. D. Johnson Co., Inc., Poughkeepsie.
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Charles Millar & Son Co., Utica, Binghamton.
NORTH CAROLINA
Hajoca Corporation, Charlotte, Asheville.
Hyman Supply Co., Wilmington, Fayetteville
Kester Machinery Co., Winston-Salem, High Point, Burlington.
OHIO
The Hardware & Supply Co., Massillon.
The Hughes Supply Co., Mansfield.
Heating Trades Supplies, Inc., Toledo.
The W. H. Klefaber Co., Dayton, Hamilton.
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Strong, Carlisle & Hammond Co., Cleveland.
OKLAHOMA
Cooper Supply Co., Tulsa.
U. S. Supply Co., Oklahoma City.
OREGON
Johnson Heating Supply Co. Portland.
PENNSYLVANIA
Bailey-Farrell Co., Pittsburgh.
Busser Supply Co., Lewisburg.
Careva Company, York.
W. A. Case & Son Mfg. Co., Erie.
Desco Corporation, Chester.
E. Keeler Company, Williamsport.
Lehigh Valley Supply Co., Allentown, Lansdale, East Stroudsburg, Easton.
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TEXAS
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Morrison Supply Co., Fort Worth, Sweetwater, Wichita Falls, Amarillo, Lubbock.
San Antonio Machine & Supply Co., Waco, Corpus Christi.
Southern Equipment Co., San Antonio.
J. A. Walsh & Co., Inc., Houston.
VERMONT
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VIRGINIA
Hajoca Corporation, Richmond, Norfolk, Danville, Roanoke, Staunton.
WASHINGTON
J. C. Bowles Co., Seattle.
Marshall-Wells Co., Spokane.
WEST VIRGINIA
Trimble & Lutz Supply Co., Wheeling.
The Universal Supply Co., Parkersburg.
WISCONSIN
Cordes Supply Co., Milwaukee.
LaCrosse Plumbing Supply Co., La Crosse.
Murphy Supply Co., Green Bay.
Wisconsin River Supply Co., Wausau.

Herman Nelson Direct Drive Propeller Fans

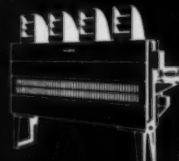
Herman Nelson Belt Drive Propeller Fans

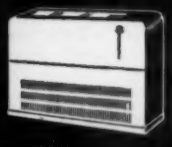
Herman Nelson Horizontal Shaft Propeller-Fan Type Unit Heaters

Herman Nelson Type H Centrifugal Fans

Herman Nelson Vertical Shaft Propeller-Fan Type Unit Heaters

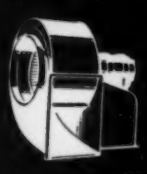
Herman Nelson Type HB Centrifugal Fans


Herman Nelson Blower-Fan Type Unit Heaters


Herman Nelson DeLuxe Unit Heaters

Herman Nelson Unit Ventilators

Herman Nelson Belt Drive Unit Blowers


Herman Nelson Direct Drive Unit Blowers

J. J. Morin's 16 room — 28 radiator home in Laconia, N. H. now heated by a Thatcher Oilmaster with Tankless Heater.

J J Morin of Laconia, New Hampshire, a wholesaler of plumbing and heating equipment for years, found it necessary to replace the heating unit in his own home during the war. He had a Thatcher Oilmaster boiler with tankless heater installed by a local contractor.

He Cut His Costs More Than Half

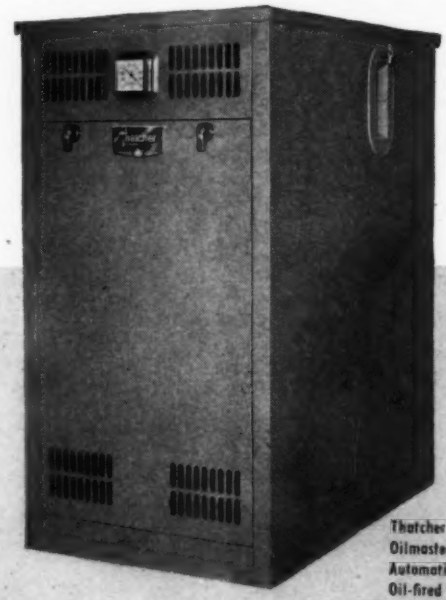
In one year Morin cut his heating and hot water costs more than half. He saved 2,100 gals. of fuel — reduced his monthly electric bill from $24.50 to $8.90, domestic water having previously been heated by electriciy.

Sell Savings Like This To Your Customers

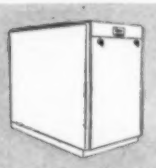
Your customers want savings like this. That's why it's easy to sell them Thatcher equipment. You see, Thatcher's complete line is keyed to economy. Each unit gives the trouble-free service Thatcher's been famous for since 1850.

To Increase Your Profits

Cash in on the name and reputation Thatcher's been building for 97 years. You'll find most people already know and trust Thatcher. That's why you recommend yourself when you recommend Thatcher — for any type of residential heating equipment.

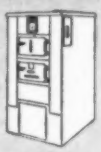


Thatcher Oilmaster Automatic Oil-fired Boiler



V Series Comfortmaster Oil fired Air Conditioner

GA Comfortmaster Air Conditioner



Triple-Fire All-Purpose Boiler

Thermaster Gravity Furnace

KEEP YOUR EYE ON THATCHER

Thatcher FURNACE COMPANY

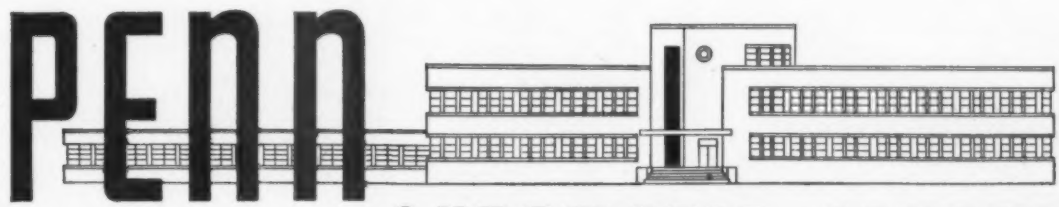
Garwood, New Jersey

SPECIALISTS IN HEATING SINCE 1850

to make "hook-ups" easier . . USE THIS NEW BOOK!

This PENN Wiring Diagrams Book is chock-full of up-to-the-minute data . . . designed to make your wiring "hook-up" and installation job easier. It contains various typical diagrams for heating systems fired by oil or coal. There are also diagrams for damper motor control circuits as well as unit heater circuits and gas boilers. Each diagram is accompanied by illustrations of the necessary controls for each system and a description of the sequence of operation.

Send for your copy of this helpful booklet today. It's yours for the asking—and it can save you time and effort. Write *Penn Electric Switch Co., Goshen, Ind.,* Export Division: 13 E. 40th St., New York 16, U.S.A. In Canada: Penn Controls Ltd., Toronto, Ont.



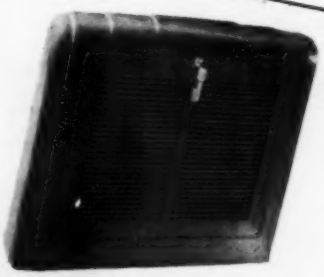
AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Proven in
Practical Use

It's ALUMINUM
It's Feather Light—
It's Stronger—Better Looking—
It's *CHAR-GALE—
And IT COSTS NO MORE!

Char-Gale aluminum fittings are made to give years of satisfaction to your customers. They are stronger, better looking, longer lasting. They are better for the men who do the job, too. Feather-light, they are easier and cheaper to handle and transport. And what a break their light weight is for the installer!



*Char-Gale Registers

Made of quality materials, carefully designed, these registers have a 12½ degree downward directional flow. Models for every type of installation are available.

PREFABRICATED DUCTS AND FITTINGS FOR WARM AIR HEATING

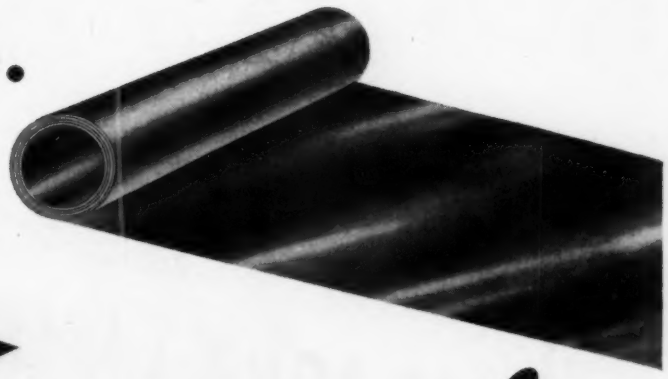
CHAR-GALE

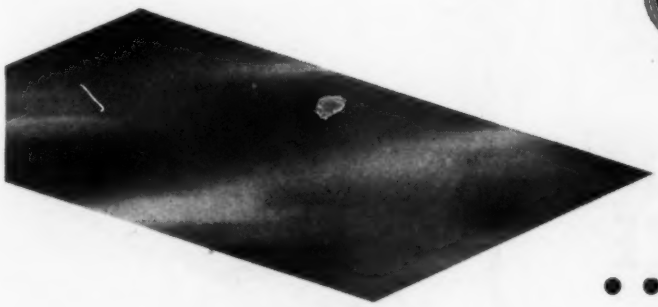
MINNEAPOLIS CHAR-GALE MFG. CO. OMAHA

* "NO HEATING PLANT IS BETTER THAN ITS INSTALLATION — NO INSTALLATION CAN BE BETTER THAN ONE OF CHAR-GALE FITTINGS"

ALUMINUM LOWEST PRICES in HISTORY

ROLLS! ....





....SHEETS!

Aluminum saves time on the job and in transit. Each pound goes as far as three pounds of heavier sheet metal. Aluminum is hard enough to be durable, soft enough to be worked on any type of sheet metal working equipment. Millions of pounds of aluminum have been used in the last six months for joist linings, ducts and fittings.

We stock 24″-26″-30″-33″-36″ widths—it can be used for fittings as well as for joist lining.

PRICE LIST

Effective August 10, 1947

Thickness .025 (approximately the same as 24 gauge steel)

Pounds	Full rolls 500 lbs.	100-lb. rolls	Sheets
30,000 and over	$0.221	$0.225	$0.228
20,000 to 29,999	.223	.227	.230
10,000 to 19,999	.226	.230	.233
5,000 to 9,999	.231	.235	.238
2,000 to 4,999	.241	.246	.248
1,000 to 1,999	.251	.256	.258
500 to 999	.281	.285	.288
100		.295	.312

NET TEN DAYS

Prices are per pound for quantities shown

Prices subject to change without notice.

Write or Wire Your Orders to

IMMEDIATE DELIVERY

PREFABRICATED DUCTS AND FITTINGS FOR WARM AIR HEATING

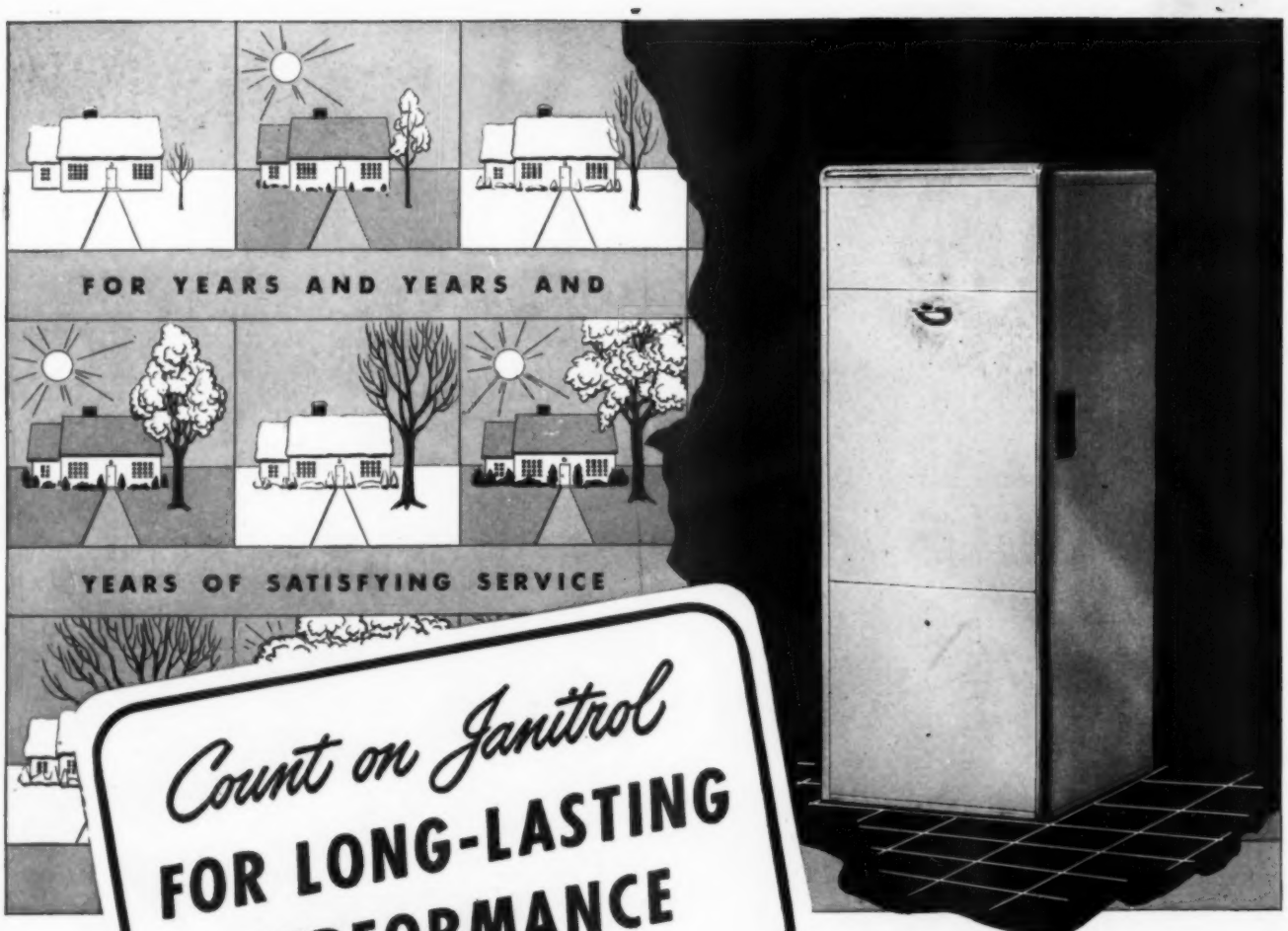
CHAR-GALE

IMMEDIATE DELIVERY

MINNEAPOLIS

CHAR-GALE MFG. CO.

OMAHA



Count on Janitrol FOR LONG-LASTING PERFORMANCE

Janitrol Winter Air Conditioners are available in 6 sizes, all fully AGA approved, with ratings from 60,000 to 180,000 Btu. imput per hr. Extremely compact, the small unit requires only an 18x27 inch floor space.

JANITROL Gas-Fired heating equipment gives top-notch performance . . . and keeps it up for years and years of satisfying service. Why? Because Janitrol is designed for long lasting operation.

For example, Janitrol cast iron Multi-Thermex heating tubes are *designed* to take *exactly the right amount* of heat from the burned gases passing through them. Too little heat extraction means waste of fuel. Too much can cause condensation and corrosion on heat transfer surfaces.

Burnouts are eliminated by the unique manner in which the Multi-Thermex tubes fit snugly over the compact Amplifire burners . . no bulky combustion chamber to build up excessive heat at the base of the tubes.

Patented design of Janitrol ribbon type burner assures uniform expansion and contraction along the entire length of each alloy strip forming the Amplifire burner heads. No buckling, no twisting, no breaking loose can occur with this construction.

And these are only a few of the many design developments which make Janitrol your best bet in supplying the heating requirements of your customers to their greatest satisfaction. Remember, Janitrol is built to last. No other gas-fired heating equipment has all of Janitrol's engineered advantages! For more information, write Surface Combustion Corporation, Toledo 1, Ohio.

Janitrol GAS-FIRED HEATING EQUIPMENT

Here's *Randall's* new, low cost bracket type bearing for blowers

Four features make this new blower bearing an outstanding value—special low price, quick installation without adjustment, quiet, dependable operation, maximum air flow. The small cross-section area and the thin bracket edges, cut air resistance to a minimum.

Your customers will like the noiseless, trouble-free service they get from installations with this new Randall bearing. The graphite-bronze bushing is accurately finished for silent operation; centered in a movable ball that's constantly self-aligning.

The unit is self-lubricating, too. A large, built-in oil reservoir assures long service.

Representatives carrying stocks:

The Berry Bearing Company
3633-35 S. Michigan Avenue
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(and all branches).

Ed. D. Maltby
1718 Flower Street
Los Angeles, California

C. W. Marwedel
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Tek Bearing Company
177 Lafayette Ave., New York 13;
510 Cambridge St., Boston 34;
924 Lafayette St., Bridgeport, Conn.

Salt Lake Hardware Co.
Salt Lake City, Utah

Moffat Bearing Company
1640 Fairmount
Philadelphia 30, Penna.

● Write for the complete story of this new, bracket type bearings for blower shafts from ½" to 1" inclusive . . . and also ask for catalog 47, with latest data on top-quality Pillow Blocks for every air handling need. You'll find valuable installation hints in it, too.

RANDALL GRAPHITE PRODUCTS CORPORATION

609 West Lake Street **Dept. 911,** **Chicago 6, Ill.**

Exclusive
FEATURES
MAKE
VICTOR
SALES
EASIER!

VICTOR

FURNACES FOR OIL, GAS OR COAL

There is prestige as well as profit in a VICTOR Dealership. Write for complete information.

- Exclusive, dependable AUTOMATIC DAMPER CONTROL!
- Triple Flue Radiator for effective, long fire travel.
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- Rigid, steel base ring with insulating air space.
- Boiler Plate Steel Welded and Riveted.

Square Casings Available Now!

The ideal furnace for conversion from coal to either oil or gas with practically no loss in efficiency

FURNACES • OIL BURNERS • STOKERS • GAS BURNERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1322 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

Timely Tips on Stainless Steel Shop Practices

No. 2 of a series

SOLDERING

ENDURO Stainless Steel in mill finishes No. 1, 2-D or 2-B will tin very readily with cut acids or stainless steel liquid fluxes. No. 4 or higher finishes first should be roughened with emery cloth or grinding wheel. Half and half solder —50% tin, 50% lead—flows smoothly and adheres to stainless steel, giving a good strong joint. Use a large soldering copper heated just above the melting point of the solder.

MAKING JOINTS

ENDURO is adaptable to all types of joints. Lock seaming, plain or flush, key lock, standing end, side, folded end or inside lock can be made readily on light gauges. Plain or lap joints can be used where stress is light. On jobs where only butt joints can be used—or for mitered corners—the strapped butt is suggested. It is preferable to tin all edges before bending, then sweat together, adding solder if needed. All soldered sections should subsequently be washed well with alkaline solution to neutralize or remove soldering acids.

CLEANING

Greasy substances deposited on ENDURO'S satin-smooth surface during fabrication can be removed easily with kerosene, gasoline or naphtha. To remove oily film, sift finely bolted whiting on the surface then wipe with a soft, dry cloth. This brings out the stainless steel's true beauty and lustre. Do NOT use metal scrapers or steel wool.

PROTECTING SURFACES

Pasting wallpaper, kraft paper or adhesive paper to the entire polished surfaces of ENDURO Stainless Steel sheets protects them from scratches and abrasions. Paper will not interfere with layout and forming, can be removed quickly with hot water or steam. Adhesive tape provides excellent small area protection. Liquid plastics can be either sprayed or dipped, dry rapidly and are easily removed.

These brief tips illustrate the wealth of information contained in Republic's two popular books THE FABRICATION OF REPUBLIC ENDURO STAINLESS STEEL and THE WELDING OF REPUBLIC ENDURO STAINLESS STEEL. Write for your FREE copies. They'll show you how to take advantage of the latest techniques in working stainless steel—put you in line to get your share of this ever-growing business.

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, New York

...AND THE BEST TIP

ALWAYS USE...

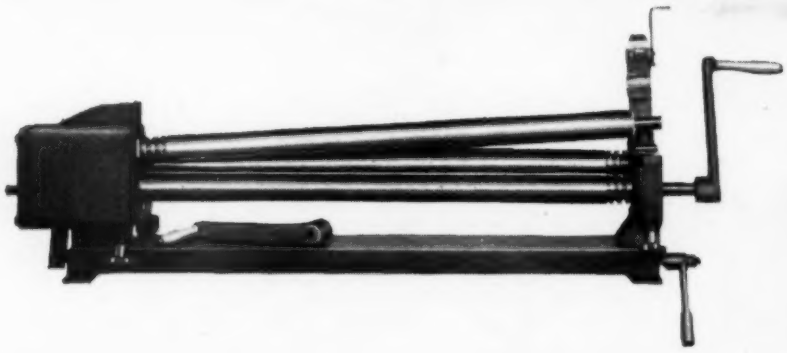
Republic

REPUBLIC STEEL

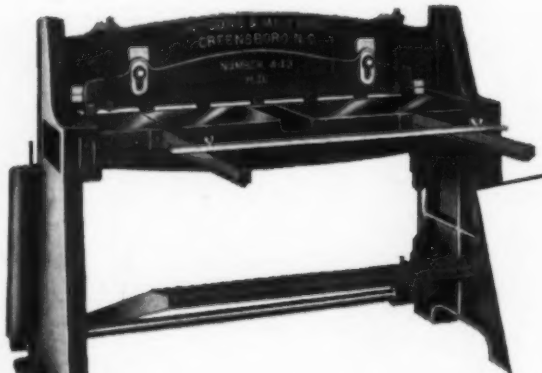
ENDURO STAINLESS STEEL

Other Republic Products include Black, Galvanized, Galvannealed and Electro Paintlok Sheets—Toncan Iron Sheets

Slip Roll Formers No. 836 and No. 842, for rolling sheets with fewer passes.



The 400 Line of Heavy Duty Foot Power Squaring Shears. Made in 36", 42", 48" and 52" sizes.



Build Profits

WITH

WYSONG AND MILES MACHINES

THE SHEET METAL MACHINES that save costly production hours. Quick acting controls and easily accessible adjustments mean less time loss in operations. Each machine designed to ease and speed the handling and feeding of the material being worked. Sturdy, finely balanced construction assures accuracy.

Save valuable production hours in your plant with the WYSONG and MILES line of Sheet Metal Machines. Jigs and fixtures are used in the machining and drilling of every part . . . your guarantee of uniformly superior machines.

Write for detailed information on the complete WYSONG and MILES Sheet Metal Line.

The No. 410 Combination Sheet Metal Machine for burring, turning, wiring, beading, crimping, elbow edging, slitting and other operations.

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GREENSBORO, NORTH CAROLINA

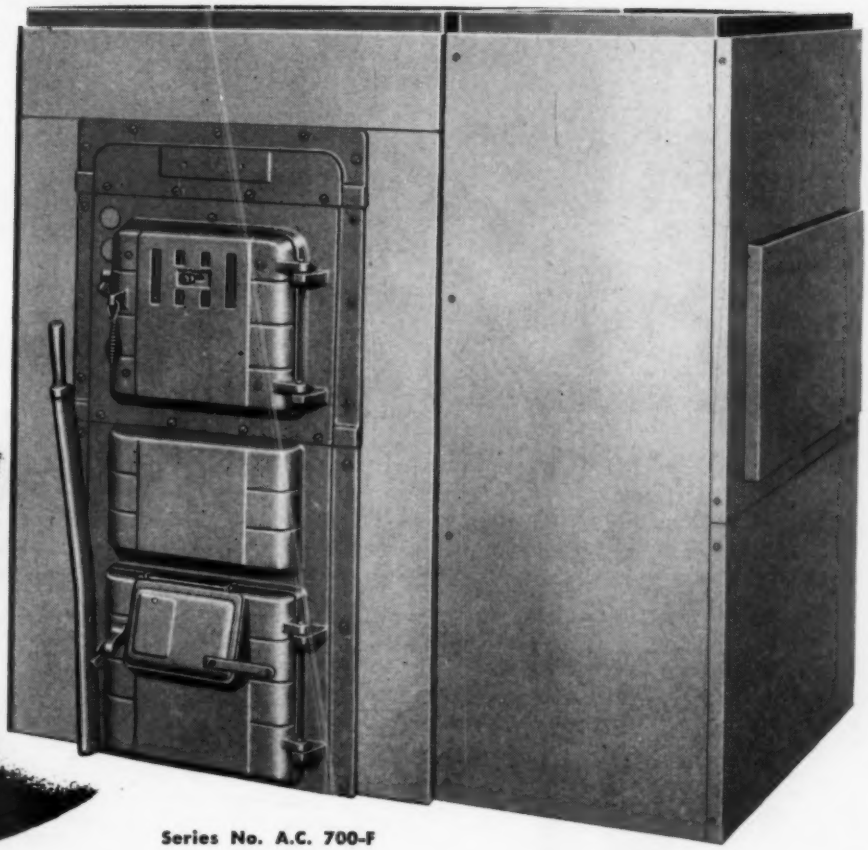
DESIGNERS AND BUILDERS OF MACHINE TOOLS FOR OVER 45 YEARS

Luxaire's New!
STEEL AIR CONDITIONING UNIT

Engineered for COAL...

WELL ADAPTED AND EASILY CONVERTED FOR

Oil... Gas... or Stoker



Series No. A.C. 700-F

A new, smart looking air conditioning unit that enhances any modern heating installation.

Compact, steel cabinet, housing both heating and blower compartments, is finished in easy to clean baked enamel. The blower compartment, with silently operating blower of large air handling capacity, rubber mounted motor, and large area filters, can be installed at either side of the cabinet.

The durable long-lived steel heating element is welded leak-proof and gas-tight by the new process of automatic submerged arc welding. Primarily designed to burn coal, the long fire travel and large heating surface make this Luxaire unit well adapted for OIL, GAS or STOKER firing at any time through the installation of conversion equipment.

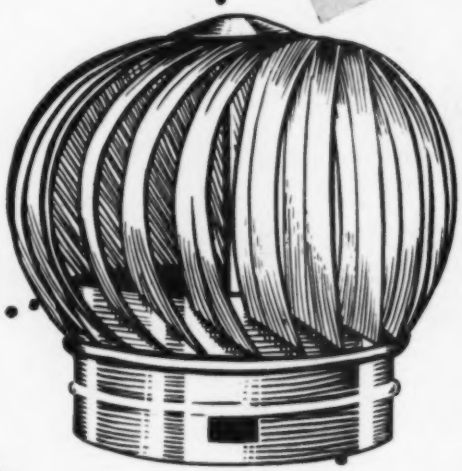
Write for complete information.

THE C·A·OLSEN MANUFACTURING COMPANY

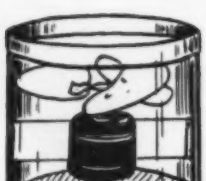
Luxaire HEATING & AIR CONDITIONING UNITS

ELYRIA 12, OHIO

LITTLE WIND



AND BIG SALES HELPS PUT ACROSS WESTERN ROTARY VENTILATORS



Westernaire Booster Fan

Westernaire Roof Exhauster

It's quality, plus advertising, plus a need, that adds up to easy quick sales for you on the Western line of ventilators. The Western Rotary Turbine Ventilator, the Westernaire Roof Exhauster and the Westernaire Booster Fan all offer the utmost in efficient ventilation—each is advertised to architects and building owners.

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510 NO. DEARBORN ST.
CHICAGO 10, ILL.

BANDWAGON

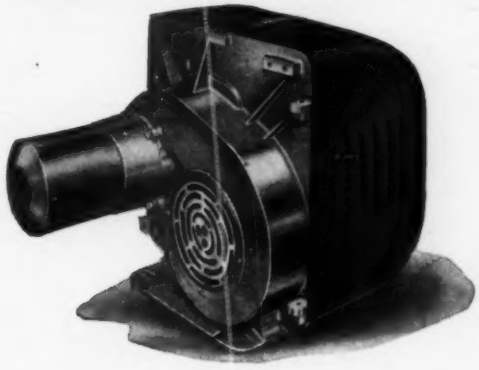
The NEW *Master Kraft* oil burner is in production

FIRST IN THE FIELD WITH NEW BURNER DESIGN

Here is truly the first postwar oil burner to hit the market — will satisfactorily burn 100% catalytic oil with same high efficiencies! It's THE answer to today's heating problems. Results of tests show that savings on fuel are as high a 20%.

Get on the Master Kraft Bandwagon—get the cream of burner sales with this new burner. BE FIRST with the NEWEST in oil heat.

The coupon below will bring you full information on how you may get a Master Kraft franchise . . . Mail it today!



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SPRINGFIELD — MASS.

Harvey-Whipple, Inc.
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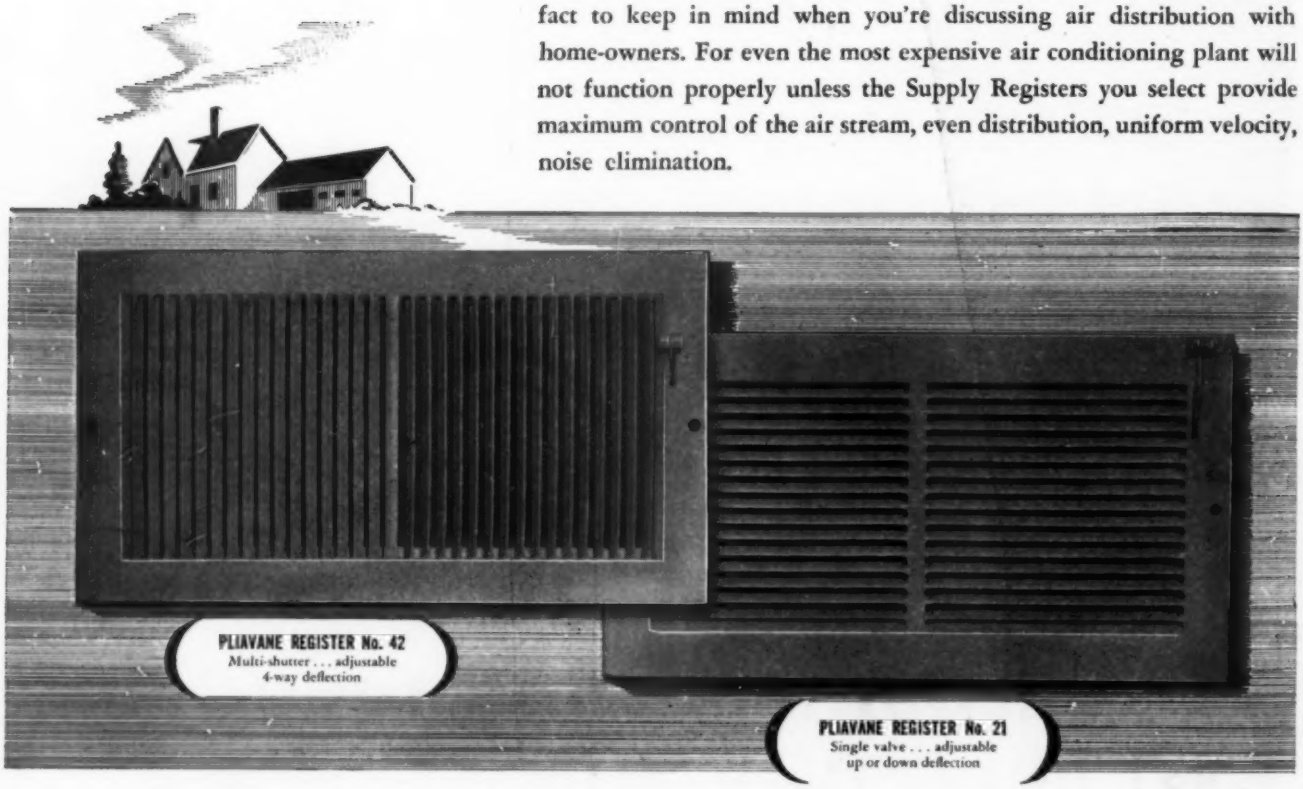
EFFECTIVE CONTROL OF AIR DELIVERY MEANS MORE EFFICIENT OPERATION OF RESIDENTIAL AIR CONDITIONING SYSTEMS. An important fact to keep in mind when you're discussing air distribution with home-owners. For even the most expensive air conditioning plant will not function properly unless the Supply Registers you select provide maximum control of the air stream, even distribution, uniform velocity, noise elimination.


PLIAVANE REGISTER No. 42
Multi-shutter . . . adjustable
4-way deflection
PLIAVANE REGISTER No. 21
Single valve . . . adjustable
up or down deflection

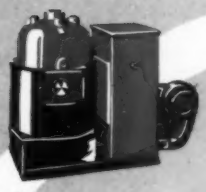
When your customers look to you for advice on the selection of equipment to meet these performance requirements, be sure of dependable results, user satisfaction. Recommend trim, attractively-designed Tuttle & Bailey PLIAVANE Registers for installation *at the vital point of air distribution.*

Two types available . . . single valve PLIAVANE Registers (No. 21) for upward or downward air deflection control . . . multi-shutter type (No. 42) that provides four-way deflection . . . face bars and back blades readily adjustable. Range of sizes in both types for sidewall or baseboard installation. May be used without frames . . . or with standard frames.

TUTTLE & BAILEY

NEW BRITAIN, CONNECTICUT

A NEW DAY IS DAWNING FOR HEATING DEALERS



Stoker-fired water heater.

Winter Air Conditioner. Gas or oil-fired.

Year-Around Air Conditioner. Heats and cools.

Winter Air Conditioner for small homes. Gas or oil-fired.

Gas and Oil-fired Boilers.

Coal Furnace. For better coal heating.

Low-cost automatic oil heat for small homes.

Stokers. Bin and hopper-feed models.

Water Heater. Automatic oil-fired.

Conversion Oil Burner for present equipment.

The Most Complete Line of Heating Products in America with a New Conception of Sales and Service Opportunities

Automatically Yours

CHRYSLER AIRTEMP
DIVISION OF CHRYSLER CORPORATION

YOU CAN MAKE EACH MONT

WITH THE CHRYSLER AIR TE

A New Approach For Heating Dealers . . .

Chrysler Airtemp's complete heating line of gas, oil or coal fired units, boilers, conversion burners and stokers for forced air, steam or hot water systems is a real profit maker for dealers. And Chrysler Airtemp makes it possible for the heating dealer to have peak profits every month of every season — the plus-profits of air conditioning for summer comfort. Chrysler Airtemp Air Conditioners can be added to forced warm air furnaces, financed as part of a new home mortgage or on an easy payment plan. Chrysler Airtemp Air Conditioners are priced to open a wide market. There's profit in the air *every day of the year with Chrysler Airtemp!*

Packaged Air Conditioners Open Up A Brand New Market For You . . .

There is a tremendous commercial market for Packaged Air Conditioners—a field in which the name Chrysler Airtemp has been at the top for 10 years! Look at the prospects — retail outlets, hotels, doctors, dentists, hospitals, public and office buildings, general offices and factories!

Chrysler Airtemp Packaged Air Conditioners can be converted to year-around air conditioning simply by the addition of a heating coil—opening up another profitable sales field for Chrysler Airtemp automatically fired boilers.

And If You Want To Add Refrigeration . . .

You'll find a sensational, complete, new line of Chrysler Airtemp Commercial Condensing Units—Sealed Radial Design. They open up new, profitable sales in replacement and service. The frozen food and pastry market is the latest *booster* in commercial refrigeration. And your application, installation and service can handle refrigeration equally as well as air conditioning.

NTH A PEAK SALES MONTH

R TEMP LINE OF PRODUCTS!

An Exclusive Line Of Exclusive Products . . .

You don't have to handle three or four different makes of heating products when you have the Chrysler Airtemp line, because it is the most complete line in America.

And What's More . . .

Each Chrysler Airtemp product has individual, exclusive engineering and design features that make them leaders in their respective fields . . . leaders in quality, leaders in proved performance, leaders in economical operation and maintenance.

Backed By A Famous Name—Chrysler . . .

You know the public has respect and confidence in Chrysler Corporation products. This is one big reason why Chrysler Airtemp enjoys such nation-wide acceptance.

An Eye To The Future . . .

The great, new research laboratories and new factory of Chrysler Airtemp in Dayton, plus the 2,000 technicians in Chrysler Corporation Engineering Division, assure an advanced design for all Chrysler Airtemp products today and in the years to come.

With Sales Advantages Today . . .

For a heating dealer who wants to handle the Chrysler Airtemp Triple Line – Heating, Cooling and Commercial Refrigeration – there are still some *4 Star Dealerships* open. You can't help but be thrilled over the way the 4 Star Dealer Program operates.

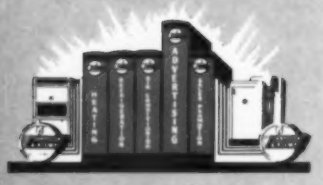
For the warm air heating dealer who wants to add cooling alone—to capture year-around sales in homes and commercial enterprises—there is a remarkable opportunity. The Chrysler Airtemp line of heating and cooling will enable you to have peak sales – year-around! That's obvious!

Factory Help For Chrysler Airtemp Dealers . . .

The day is past when the dealer is expected to operate just "on his own". Chrysler Airtemp has a pattern of distribution — sales policies — cooperative sales training and advertising plans — that give the dealer a running start . . . help keep him going on a profit basis!

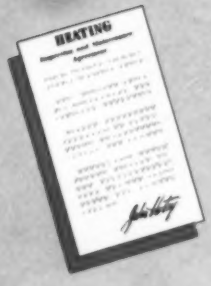
Advertising . . .

Throughout the country, national magazines carry a regular sales clinching type of advertising. It brings inquiries — they're passed on to the dealer. Newspaper, radio and poster advertisements are prepared for the dealer—so he can tie in with the national advertising — and the factory shares the cost. These advertising messages pull inquiries, too—make prospects show their heads.



Manuals And Literature . . .

Practical sales manuals covering each product, its design, construction, application and installation for all three lines — heating, cooling and refrigeration — make it a simple matter for Chrysler Airtemp dealers to train their sales and service organization. Hard-hitting sales literature, on all products, can put Uncle Sam and mailing lists working for you.



Revenue From Service . . .

Chrysler Airtemp has some very acceptable service policies—types of customer agreements that assure top-flight operating for all equipment—plus profitable revenue for the dealer. The public is ready for this much-needed, necessary "continued contact" with dealers.

Get Set Now For All Season Sales . . .

Well, if you have read this Chrysler Airtemp message to heating dealers — you are now ready to "find out more"! You'll find it worthwhile to have our representative call upon you. So send in the coupon. He'll be at your office on short notice. Want to see him?

MAIL NOW FOR DETAILS

Airtemp Division of Chrysler Corporation
Dayton 1, Ohio

Name_____

Address_____ State_____

City_____ AA (L-1)

Products_____

Automatically Yours

CHRYSLER AIRTEMP
DIVISION OF CHRYSLER CORPORATION

BETTER HOME HEATING FOR EVERY HOME

HEATING • AIR CONDITIONING • COMMERCIAL REFRIGERATION

The Only 100% Mercury Switch Equipped Controls

MERCOID CONTROLS

1ST

IN ··· QUALITY
ACCURACY
DURABILITY
PERFORMANCE
DEPENDABILITY
SAFETY FEATURES
EASY INSTALLATION
QUICK ADJUSTMENTS
SIMPLIFIED WIRING
UNFAILING SERVICE

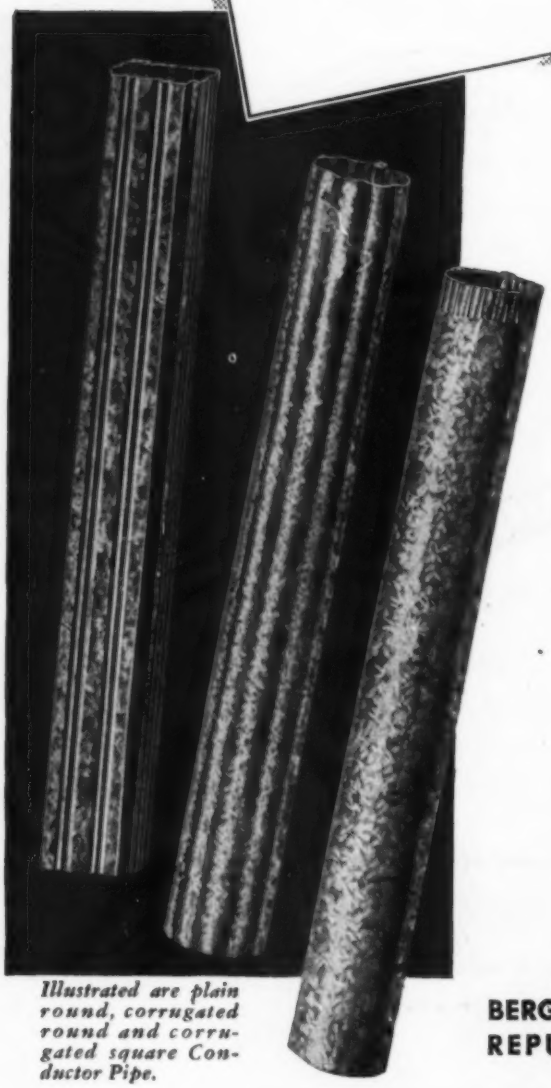
Mercoid Controls have a fine record in the background of field experience.
They are builders of customer good-will.
Servicemen like to install them.
They eliminate complicated hook-ups and are easy to adjust.
There is a Mercoid Control for every automatic heating requirement.

Catalog sent upon request.

THE MERCOID CORPORATION · 4229 BELMONT AVENUE · CHICAGO · 41 · ILLINOIS

MANUFACTURERS OF DEPENDABLE AUTOMATIC
CONTROLS FOR A QUARTER OF A CENTURY

Easy to Handle—
Easy to Hang
BERGER CONDUCTOR PIPE



Illustrated are plain round, corrugated round and corrugated square Conductor Pipe.

...is formed in long lengths on machines that never vary. Each length is accurately formed and true to size. Joints fit snugly and easily . . . every time.

Because it always is *uniform,* this improved conductor pipe handles easily and hangs easily.

Made from galvanized open-hearth and copper-bearing steel, Toncan Iron and copper, Berger Conductor Pipe resists rust. Strong, rigid shoulders prevent seam collapse . . . resist distortion and twisting when installed.

See your local distributor about Berger Conductor Pipe and Accessories—also SNAPTITE Eaves Trough, Roofing of all types and Metal Lath.

BERGER
REG U S PAT OFF
CONDUCTOR PIPE

BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
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Warehouses in Boston, Philadelphia and St. Louis

REPUBLIC STEEL
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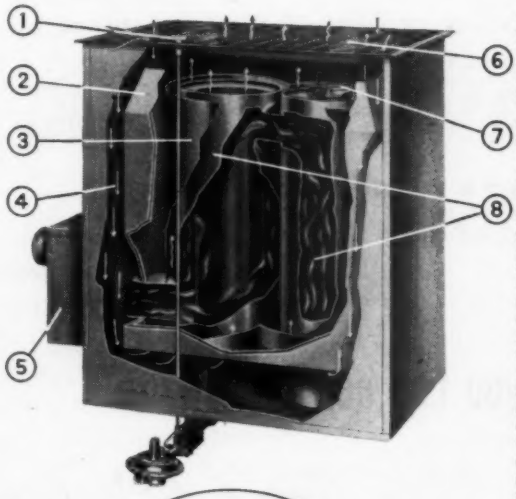
SAGINAW FLOOR FURNACE

Popular SUNBEAM Unit by

AMERICAN-Standard

■ The Saginaw Floor Furnace means extra business for you. For plenty of families right in your own community are in the market for a quality gas fired unit like this. Available in four popular sizes, it is ideal for small homes with or without a basement, and for stores and similar structures. Moreover, the Saginaw is within the means of the smallest budget—both as to initial investment and operating cost. Shipped completely assembled for easy installation, it burns natural, manufactured, mixed, or liquefied petroleum gas. Complies with National Safety requirements approved by American Gas Association. And, like other products bearing the famous American-Standard Mark of Merit, the Saginaw Floor Furnace can be sold for modernization on the Heating & Plumbing Finance Corporation convenient Time Payment Plan. For details, contact your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation,** P. O. Box 1226, Pittsburgh 30, Pennsylvania.

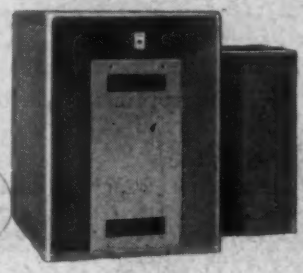
A QUALITY UNIT THAT GIVES YOU ALL OF THESE ENGINEERING FEATURES



1. CONVENIENT MANUAL CONTROL — removable key easily operates main burner and pilot valve through register face. Automatic controls available at slight extra cost.
2. SEPARATION CASING — prevents overheating of return air passage, thus improving air circulation and reducing outer casing temperature. Easily removable, thus making inside of furnace accessible for cleaning.
3. BAFFLE — absorbs radiated heat from heating element and presents additional heating surface to the circulated air.
4. RETURN AIR PASSAGE — correctly proportioned to insure unrestricted flow of air from the floor through the unit.
5. DRAFT HOOD — expertly designed to provide proper draft control and protection to burner against down draft.
6. REGISTER — easily removable. Sturdily constructed of fabricated steel with enamel finish.
7. OBSERVATION PORT — for observing pilot and main burner flame.
8. COMBUSTION CHAMBER AND RADIATOR —fabricated from heavy gauge steel with all seams welded for permanent tightness. Ample surface enables greatest amount of heat to be absorbed from flue gases before they enter chimney. Adequate height gives necessary thermal head for superior air circulation.

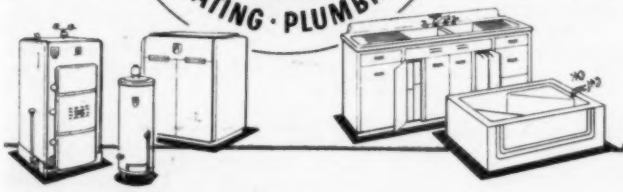
Other Best-Selling Sunbeam Units

The **SENECA** Winter Air Conditioner. For small to medium sized homes. Burns natural, manufactured, mixed, or liquefied petroleum gas. Copper bearing steel heating element resists corrosion and rust. Baffles in large radiator conduct gases through 3 passes, heating entire radiator completely before gases enter flue. Convenient radiator clean-out plates are readily accessible through special openings in jacket. Complies with National Safety requirements approved by American Gas Association. Available in 5 sizes with capacities ranging from 70,000 to 150,000 Btu. input per hour.



The **WESTMORELAND** Winter Air Conditioner brings the comforts of automatic oil fired heating to homes of virtually any size. It is designed to perform as a completely coordinated oil heating unit with the Arcoflame Oil Burner, or to give efficient service with any other standard pressure atomizing burner. Made in 6 sizes with capacities at the register ranging from 105,000 to 330,000 Btu.

AMERICAN-Standard HEATING · PLUMBING



Serving the Nations' Health and Comfort

LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels—Radiators, Convectors, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads.

Convert to

Kaiser Aluminum Utility Sheet

Lowest price Aluminum Utility Sheet ever offered

Now—a thousand new uses for aluminum!

Opening the way is the lowest price aluminum sheet ever made for so many applications: Kaiser Aluminum Utility Sheet.

Strong, light, it is a controlled alloy, high grade aluminum sheet through and through. Not clad. Not veneered.

In most applications it will last a lifetime. It cannot warp, rot, shrink or rust, and need never be painted. Its appearance alone will add much to the value of your product!

Its light weight—⅓ that of steel—permits easy handling, easy installation. Its outstanding workability makes it easy to form in any shop. And it is rugged enough to take a Pittsburgh Lock Seam!

Converting from other materials is probably far easier than you think. With our engineering assistance, forming, fabricating and finishing problems have been solved by countless other manufacturers.

Their experience can help *you!*

Check these typical possibilities for conversion—is your product among them?

1. Heating, ventilating ducts
2. Building applications—flashing, valley material, ridge rolls, etc.
3. Farm utility buildings—brooders, feed troughs, etc.
4. Air conditioning equipment
5. Portable buildings and sheds
6. Furnace enclosures and accessories
7. General sheet metal work

In all these fields and more . . . you can convert now to

Kaiser Aluminum Utility Sheet

a Permanente Metals product

Call any of the Permanente Metals' sales offices listed below, or write direct to:
Permanente Products Co., Consumer Service Division, Kaiser Building, Oakland, California

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EXPORT DEPARTMENT: E. Rothschild, 1924 Broadway, Oakland 12, Calif. TWinoaks 3-4600

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BUFFALO: J. K. Nyburg, 931 Rand Bldg. MAdison 4503

CHICAGO: C. S. French, 360 North Michigan Ave. DEarborn 4256

CINCINNATI: H. A. Weilage, 411 Union Central Life Bldg. MAin 6422 and 6423

CLEVELAND: H. L. Gebauer, 204 Rogers Bldg., 1720 Euclid Avenue MAin 0281 or 5794

DALLAS: Wayne B. Lake, 211 Construction Bldg. RIverside 3562 and CEntral 1501

DETROIT: M. R. Erkid, 4055 Penobscot Bldg. CAdillac 9763

HARTFORD: R. M. Hillard, 337 Capitol National Bank Bldg. HArtford 4-0392

KANSAS CITY: G. N. Houck, 402 Waldheim Bldg. HArrison 0829

LOS ANGELES: E. C. Van Wie, 670 Subway Terminal Bldg., 417 South Hill Street MAdison 6-4801

MILWAUKEE: R. C. Gubbins, Room 1147, 710 North Plankinton Avenue BRoadway 4139

MINNEAPOLIS: T. J. Gerber, 2107 Foshay Tower GEneva 5082

NEW YORK CITY: R. C. Maentz, Suite 314, British Empire Bldg., 620 5th Avenue CIrcle 6 5343

OAKLAND: J. T. Leslie, 15th Floor, Latham Square Bldg. TWinoaks 3-4600

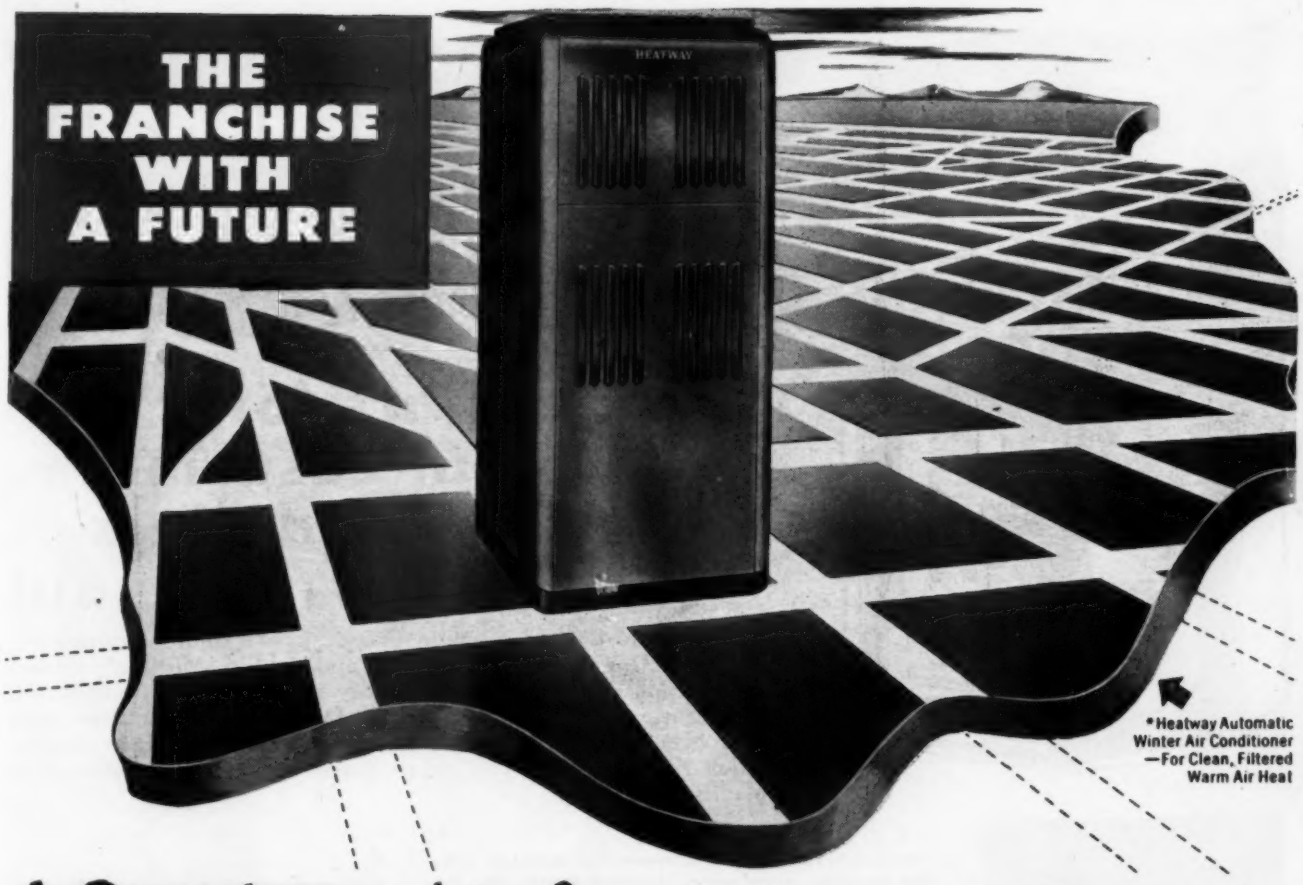
PHILADELPHIA: E. R. Dunn, 1164 Broad St.-Suburban Station Bldg. LOcust 4-0325

SEATTLE: J. J. Carlson, 308 Hoge Bldg. MAin 1001

ST. LOUIS: H. N. May, 889 Arcade Bldg., 812 Olive Street CHestnut 8068

WASHINGTON, D. C.: Fred Drewes, 1210 Eighteenth Street, N.W. DIstrict 3718

WICHITA: R. O. McKee, 325 Beacon Bldg. 3-2867



A Distributorship for an Exclusive Territory to Sell Heatway Appliances

THE HEATWAY FRANCHISE offers you a line of products that you can sell not only *today*—but in the future when the competition really gets tough!

Heatway is a national organization with millions invested in factories and research facilities. From these plants comes a full line of heating appliances—gravity furnaces, automatic winter air conditioners, console heaters, floor furnaces, blowers—in all sizes, for all fuels!

All of these appliances are "tops" in design and engineering. And research is constantly developing new improvements. So when you get a Heatway franchise, you're backed up by an organization that is producing for today and planning for tomorrow.

You have the advantage of buying all of your appliances through one source—which means that you can get assorted merchandise in quantity and take the profitable discount for carload lots.

You have the backing of national advertising which sifts out interested appliance customers by name. These prospective buyers are referred to their local dealer. There's an extra 2% advertising allowance on all earned invoices.

And your dealers enjoy the Heatway Floor-Finance Plan, which permits them to carry a full line of appliances for only a 10% cash down payment.

Distributorships are still open. Act now if you want profits for today—and tomorrow! Just send in this coupon.

***HEATWAY AUTOMATIC WINTER AIR CONDITIONER. Up-to-the-minute in design and engineering, it's fully automatic. Heatway plants are now producing it in quantity. The Automatic Winter Air Conditioner and all the other Heatway appliances are available for immediate delivery.**

HEATWAY

Modern Heating for Modern Living

HEATWAY, Dept. H-C6
20 West 43rd Street, New York 18, N. Y.

I'm interested in the Heatway Franchise.

NAME.....

FIRM.....

ADDRESS.....

CITY..... STATE.....

FIREPOTS RENEWED WITH FIRELINE

SAVE dollars for your customer . . make EXTRA dollars for you!

When you have a cracked firepot job to handle, remember what Fireline does: It forms a firepot within a firepot—a complete lining of durable, high-quality refractory that withstands temperatures up to 3000 deg. F., a far higher temperature than ever occurs in any domestic furnace. And it does it in double-quick time, sending you on to the next job and to increased profits.

Fireline is packed in 100-lb. drums. Also packed in 50-lb. pails for lining heating stoves, circulating heaters, etc.; and in 5 and 10-lb. cans for repairing cook stoves, hot water heaters, etc.

Easy to install, moist, plastic Fireline is simply pounded into place with a hammer, then trimmed smooth. That's all. Nothing to mix, nothing to add. No need for new castings.

WHAT IS FIRELINE?

Fireline is a high-quality refractory moulding material in moist, plastic form which is installed as a complete lining entirely around the firepot. The fire bakes it into a durable, one-piece lining which withstands temperatures up to 3000 deg. F. Fireline is highest-quality industrial type refractory which has been expressly adapted to domestic requirements.

WHAT DOES FIRELINE DO?

Fireline repairs cracked and burned-out firepots—without new castings—without dismantling the furnace. Fireline seals the castings gas-tight. It prevents the escape of gas, odors, and soot into the building. It produces a hotter fire because it radiates and reflects heat across the entire fuel bed which means a hotter fuel bed and better combustion.

HOW IS FIRELINE INSTALLED?

Fireline is installed through the furnace door, easily and quickly. Just pound it into place with a hammer and trim it smooth. That's all there is to it. No need to dismantle the furnace. Fireline is ready to use—nothing to mix—nothing to add.

EVERY FURNACE NEEDS FIRELINE!

Even furnaces in good condition need Fireline because it protects good firepot castings and saves fuel. For steel furnaces, it can be moulded to any shape to replace or patch the refractory tile.

Fireline is stocked by leading jobbers everywhere. Ask your jobber for prices and discounts on Fireline heating specialties or write us for free bulletin and descriptive literature including tables to tell you quantities required for furnace jobs of various sizes.

Fireline is installed 1 to 1½ in. thick. The average 22 to 24 in. furnace requires 100 lbs. for a complete lining around the entire firepot.

IRONSET FURNACE CEMENT

The high-quality cement for setting up new furnaces and recementing old ones. Withstands higher temperatures. Will not crack, shrink, or blister. Gives a high degree of permanence to your work. Try it on your next job and watch it produce other customers for you. Packed in 5 and 10-lb. cans.

FIRE-HEARTH CASTABLE

The ideal refractory for setting stokers, sealing tuyeres, and precast combustion chambers. Also for making furnace baffles. Easy to use: Just mix with water, pour into place, and trowel smooth. Sets without heat. Packed in 50 and 100-lb. bags.

FIRELINE STOVE & FURNACE LINING CO.

1816 N. Kingsbury St.
(Dept. I), Chicago 14, Ill.

A "Dealers' Dozen" of the Hottest Selling Points in the Heating Industry

No one expects any product to sell itself, unassisted. Think how much the sales effort is lightened, however, when you've got a hard-hitting and provable story like this to tell.

SUPERFEX "Round the Clock" Heating offers . . .

1. Exclusive "Homogen-Air" system. Has three-stage, non-stop fire, automatic variable speed blower.

2. Two furnaces in one.

A. Peak (high fire) capacity for the coldest weather demand.
B. Automatic cut-back to economical low and pilot fire operation to maintain comfort during "in between" mild weather.

3. Healthful "live air" action.

4. Avoids layer cake separation of heat, which means . . .

A. Uniform temperature, floor to ceiling, all rooms.
B. Warm floors. No "Cold leg zone".
C. All-over comfort.

5. Gas or oil-fired models. (Designed for it . . . not conversion burners.)

6. Proved fuel economy.

7. Summer Fanning and Filtering facilities.

8. Heavy, long-life construction throughout.

9. Scratch and chip-resisting finish. (Bonderized steel grips attractive baked enamel.)

10. A size and style for every type of home.

11. Companion line of "Thermaflow" non-blower models also with continuous three-stage fire.

12. Special units for popular basementless type homes.

13. Wide consumer acceptance based on long successful performance.

Plus

A Profit Protected exclusive franchise.*
Sound national advertising support.
Effective Dealer Help materials.
Quality and performance leadership insured by the finest development laboratory in the heating industry.
Backing by the big-name company with a 60 year history and a sure future.

*** There are a few (and we do mean few) such franchises still open in good territories. Qualifications are simple, but specific . . Determination, Dependability, a bit of DO. If you've got 'em, plus a sincere Desire to build a permanent business, contact the home office without delay.**

Superfex FURNACES

GAS OR OIL

PERFECTION STOVE COMPANY

7919-B Platt Avenue • • • • Cleveland 4, Ohio

You don't have to sell them HEALTH!

Every home owner knows the discomforts of dry hot air. Health authorities agree that moist air prevents colds and respiratory ailments, promotes health and vigor. Every home owner wants the kind of healthful comfort that is provided only by Thermo-Drip Heat Regulated Humidifiers.

Thermo-Drip Humidifiers moisten the air as it is heated—*in direct proportion to temperature.* Thermo-Drip Humidifiers positively regulate water feed and accurately control the amount of evaporation so that the minutely correct percentage of moisture is aded to the air at all times. Thermo-Drip equipped furnaces give your customers the kind of health protection that doctors approve.

Thermo-Drip Humidifiers are manufactured from the finest materials and are designed and engineered to simplify your installation. Made in a variety of pan sizes for every type or make of warm air furnace. Write today for all the facts.

THERE'S A THERMO-DRIP HUMIDIFIER FOR EVERY TYPE OR MAKE OF WARM AIR FURNACE

THERMO-DRIP
HEAT REGULATED
HUMIDIFIERS

Made by
Automatic HUMIDIFIER CO.
CEDAR FALLS . . IOWA

Rybolt STEEL GAS FURNACES

Competitively Priced for Today's Market

Now in production, Rybolt announces two new steel gas-fired furnaces—SERIES RG 51 Gravity and SERIES RG 52 Forced Air.

Being lower priced than cast iron units, these two steel models offer the dealer an unusual opportunity to meet competition on sale of gas furnaces for new homes or for replacement, where gas companies permit installation of gas-fired units.

Like the Rybolt cast iron units these new series are attractive in design and finish, unusually compact to conserve space and are furnished in a range of sizes to meet the requirements of homes large or small, old or modern. The heavy gauge steel heating elements provide rapid heat transfer which facilitates economy of fuel consumption.

RYBOLT SERIES RG 51 and RG 52 have been approved by the American Gas Association for use with natural, mixed, manufactured or liquefied petroleum gas.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

RYBOLT SERIES RG 52 steel gas-fired winter air conditioner is noted for its universal application for basement or first floor utility room. Compact, efficient and economical. Made in three sizes: 70,000 BTU, 105,000 BTU and 140,000 BTU per hour input ratings. For larger capacities two single units may be combined.

RYBOLT SERIES RG 51, steel gas-fired gravity furnace is unusually compact, simple to operate and economical in fuel consumption. Made in three sizes: 60,000 BTU, 90,000 BTU and 120,000 BTU per hour.

rh

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO

Comfort is profitable

Sell "DETROIT" Float Valve Equipped Heating Units..

The first man who solved his housing problem by evicting the animals from a cave was following a universal human urge—desire for comfort. That desire has been one of the great driving forces of civilization. Always the man who sells comfort finds a desire for his wares.

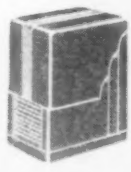
Sell more comfort at a profit with "Detroit" Float Valve equipped space heaters, water heaters, ranges and furnaces.

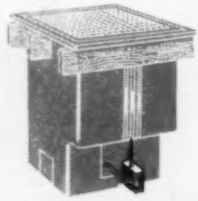
They provide clean, reliable oil heat—automatic if desired.

The user is assured of reliable fuel regulation. "Detroit" Float Valves are simple, extremely durable—easy to clean. Fully temperature compensated, fuel flow is uniform regardless of fuel temperature. Full heater output is assured at all times.

2749

"DETROIT" Float Valve





Guardian of the Home Fires

DETROIT LUBRICATOR COMPANY

"DETROIT"

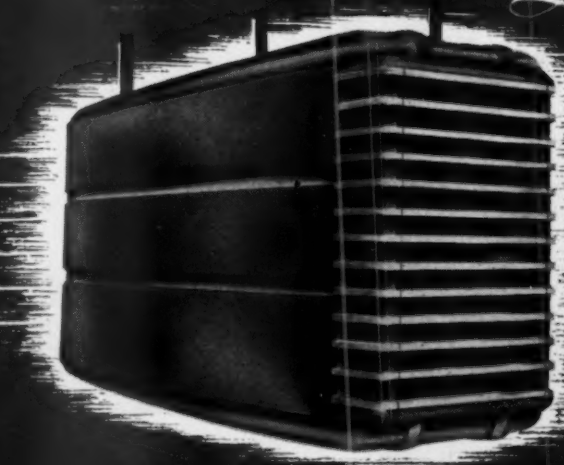
General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

Division of American Radiator & Standard Sanitary Corporation

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

New FUNCTIONAL Beauty



...for Stores, Industrial and Public Buildings...

Take another look! Here is one of the most strikingly handsome gas-fired, warm air space heaters ever developed. It's the new Pacific Suspended Heater ... right now going into volume production ... the answer to the Building Industry's need for a fully enclosed, completely streamlined Suspended-type Furnace for industrial, institutional and commercial heating.

Decidedly a "pin-up" in appearance, the Pacific Suspended Heater is a product of Norbert Shaeffer, famed industrial designer, yet, its beauty is more than "skin-deep." With controls and fan completely enclosed, this unique development of Naco Engineering Laboratories—embodying the exclusive Thermo-flo heating element—combines the highest efficiency known in gas heating.

A few dealer franchises are open for this unit as well as the entire Pacific line-up of outstanding gas heating equipment. Write this 34-year-old pioneer gas heating firm today for full information.

Pacific

SUSPENDED HEATER

PACIFIC HEATER DIVISION

NACO MANUFACTURING CO.

P. O. BOX 310 HUNTINGTON PARK, CALIF.

PRECISION *and* CRAFTSMANSHIP *at* CRESCENT*

Heavy, modern machinery, such as this broach, insures sharp and accurate machining of Crescent Tools.

Frequent inspections during production eliminate size variation and provide a continuous check on quality.

A huge array of gauges including Verniers, Go and No-Go, Dial Micrometers and many others, are constantly checked against standards.

● Complete control of quality throughout manufacturing operations at CRESCENT is more than idle boast... it is reality. Many elements are combined to insure continuous production of quality tools: Heavy, modern machines hold tools firmly, insuring clean, sharp and accurate machining. Forging dies are cut to templates to assure uniformity of parts... resulting in perfect interchangeability for repair parts, even though they are made years later than the tool in which they are used. Frequent inspections during production eliminate the possibility of machines getting out of adjustment and varying from allowable tolerances. Gauges used for inspection are constantly checked against standards.

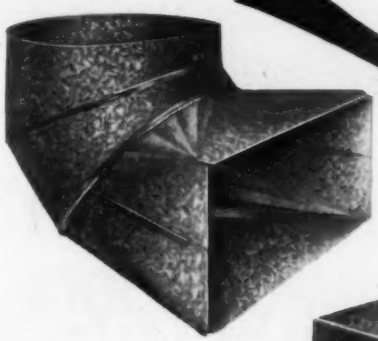
Beyond this mechanical control is an intensive, never-ending search for new methods to keep CRESCENT production up-to-date. Complaints are immediately investigated and their causes corrected. At regular meetings of CRESCENT foremen, new methods and problems are discussed and solved. All of these precautions are part of a program designed to give users of CRESCENT Tools the best product obtainable through *quality* production.

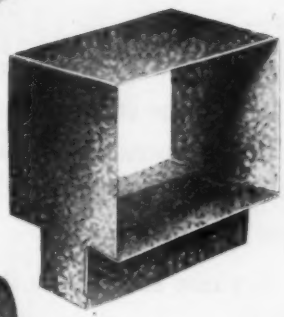
***CRESCENT TOOLS**
Give Wings to Work

CRESCENT TOOL COMPANY, Jamestown, N. Y.

*"CRESCENT" is our trade mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.

YOUR JOBBER plus OUR PRODUCT means extra profit for you!





Ordering C&L LAMNECK furnace pipe and fittings from your jobber means extra profit for you two ways. First, you don't tie up your money in large inventories. And, second, you get fast delivery, avoiding costly on-the-job delays. That's why we say . . . . "Always specify C&L LAMNECK *from your jobber!*"

Write for the new C&L Lamneck catalog today.

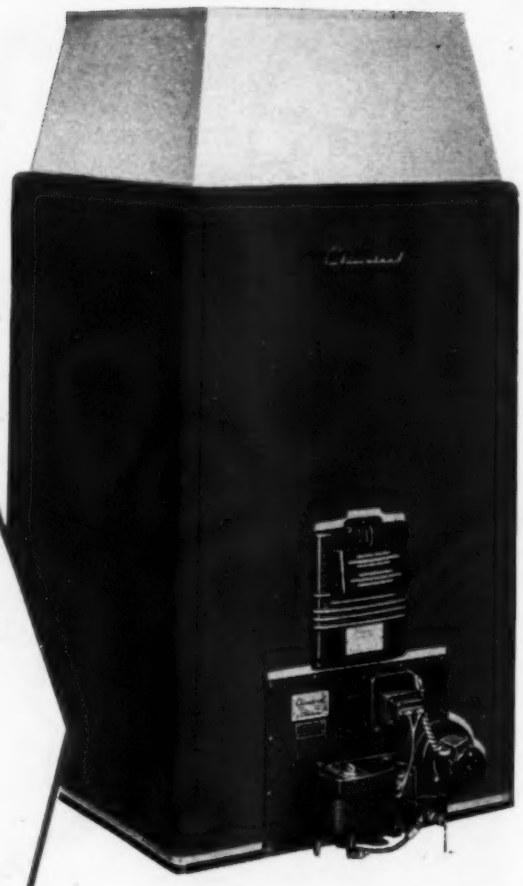
CLAYTON & LAMBERT MFG. CO.
1760 DIXIE HIGHWAY • LOUISVILLE 10, KY.

ACCURATE FIT — FASTER INSTALLATION!
C&L Lamneck furnace pipe and fittings are quick and easy to install, saving time and expense on the job. They're made right to fit right!

OTHER C&L PRODUCTS: C&L BLOW TORCHES, FIRE POTS; C&L HOFFMAN WATER HEATERS; BUCKEYE CORN CRIBS, GRAIN BINS; SILVER SHIELD SILOS.

Specify C&L Lamneck FURNACE PIPE AND FITTINGS

Whether the shortage in your community is gas or oil — here is your answer to present restrictions. The Mueller Climatrol 201 Convertible Furnace is engineered for equal efficiency with OIL or GAS — converts to either fuel later, at a moderate cost.



The Mueller Climatrol 201 Convertible Furnace

solves your problem of temporary fuel restrictions

If it's a gas shortage in your community, you can sell an oil furnace to people who want gas and can't get it — converting with a gas burner when the shortage is over. If it's a fuel-oil shortage, reverse the process. The complete, versatile Mueller Climatrol line brings the Mueller dealer out on top again!

With the Convertible 201, your customer will be getting automatic heat *all the time* . . . with the efficiency of an oil-designed job when he burns oil — and the efficiency of an AGA-listed gas-designed job when he burns gas for home-heating.

It's easy to see why the Mueller Climatrol dealer is always on top. Sell the line that does the most for your customers and for you—install Mueller Climatrol on every new home and replacement job you handle.

Write for bulletins.

The Mueller Climatrol 202 Winter Air Conditioner consists of the 201 Convertible Furnace shown above, plus a blower package. The blower is a reversible unit and can be arranged on either the right- or left-hand side.

L. J. Mueller Furnace Company

2010 W. Oklahoma Avenue • Milwaukee 7, Wisconsin

MUELLER Climatrol

D-76

Every Season is INDOOR COMFORT* season

The best time to sell Indoor Comfort is *right now!* Winter, Spring, Summer, Fall, customers for whom you have installed air-conditioning or forced warm air will buy this extra plus . . . electronic air cleaning by Raytheon.

The Raytheon Precipitator is readily connected to any existing forced warm air or air conditioning system. It removes from the air even the finest particles of airborne dust, soot, pollen and tobacco smoke. Home Owners are buying this unit because it keeps the home *clean* . . . vastly reduces costs of re-decoration, and cleaning of rugs, drapes, upholstery. In addition, Raytheon Electronic air cleaning brings new relief and restful sleep to sufferers from dust allergies and hay fever.

Ask your Heating Wholesaler or Furnace Manufacturer about the Raytheon Precipitator, available now for new or existing installations. Write for Bulletin DLP-509AM.

RAYTHEON

Excellence in Electronics

RAYTHEON MANUFACTURING COMPANY

COMMERCIAL PRODUCTS DIVISION

WALTHAM 54, MASSACHUSETTS

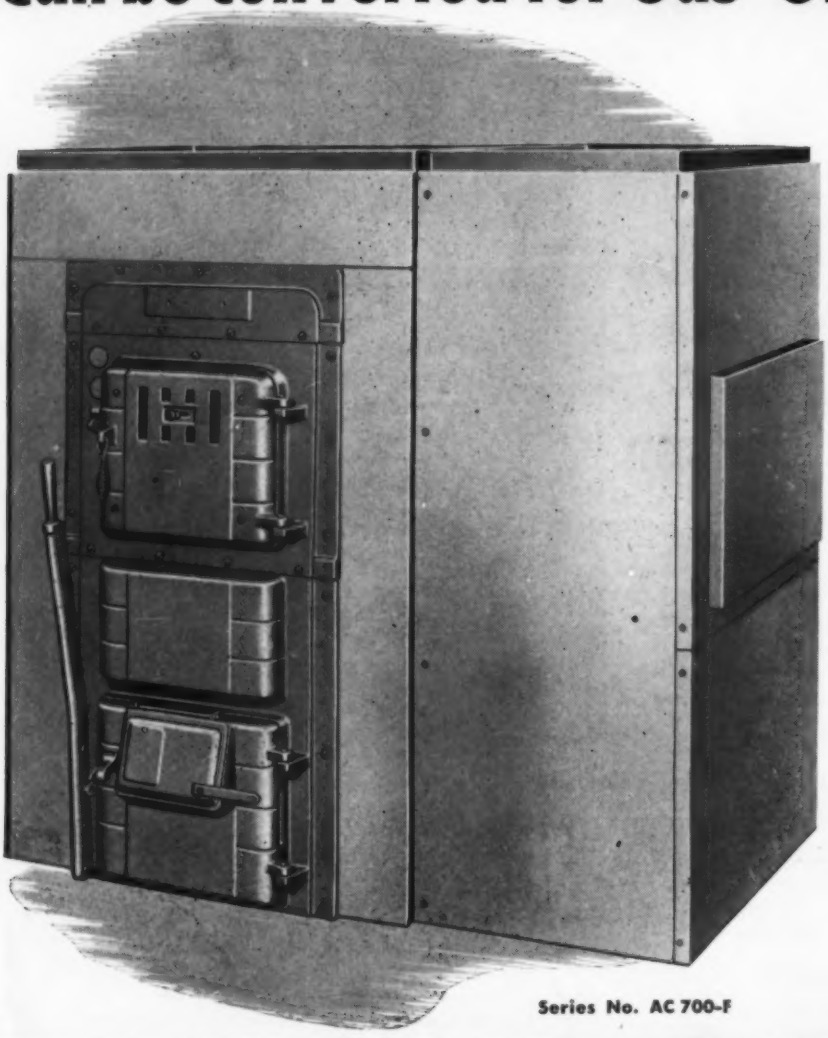
Industrial and Commercial Electronic Equipment, Broadcast Equipment, Tubes and Accessories

Sales Offices: Atlanta, Boston, Chicago, Cleveland, New York

Write for Illustrated Bulletin DL-P-509

MONCRIEF'S New Air Conditioner that Solves "Fuels Restrictions"

Designed to burn Coal—
Can be converted for Gas•Oil•Stoker Firing



Series No. AC 700-F

Moncrief ingenuity has come to the front again with a new design in coal-fired air conditioning equipment that can be readily converted to an oil or gas-fired unit.

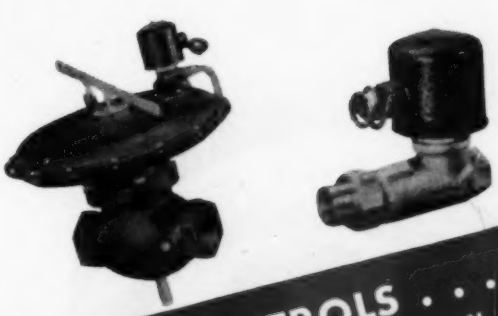
The excellent design and construction of the rugged, steel heating element, with long fire travel and large heating surface, provide the necessary qualifications for the versatility of this unit.

A new cabinet that allows the full height blower compartment to be assembled at either side, is finished in smooth, glossy baked enamel.

Abundant air circulation is provided by the large, silent operating blower. An automatic humidifier supplies the necessary moisture. Motor is rubber cushioned to prevent operating noises. Large filter area assures a long period of air cleaning without frequent replacement of filters.

THE HENRY FURNACE COMPANY • *Medina, Ohio*

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS



GENERAL CONTROLS . . .

THE ACKNOWLEDGED STANDARD IN AUTOMATIC PRESSURE, TEMPERATURE AND FLOW CONTROL UNITS

Here are a few of an outstanding line of controls for Industrial, Commercial and Domestic applications.

★ALL-GAS CONTROLS
★AIRCRAFT CONTROLS, ELECTRIC
★AUTOMATIC SAFETY PILOTS
★GAS REGULATORS
★LOW WATER CONTROLS
★GOVERNOR TYPE VALVES
★HI-LOW-OFF VALVES
★INDUSTRIAL VALVES
★LOW PRESSURE GAS VALVES
★MOTOR OPERATED VALVES
★MAGNETIC GAS VALVES
★PILOT BURNERS
★PILOT GENERATORS
★REFRIGERATION VALVES
★SOLENOID VALVES
★STRAINERS—RELAYS
★100% SHUT-OFF VALVES
★THERMOSTATIC CONTROLS
★TRANSFORMERS—SWITCHES
★THERMOVALVES

Controls for air, water, steam, natural, manufactured and liquefied petroleum gases, light and heavy oils, etc., refrigerants such as: freon, methyl chloride, sulphur dioxide and ammonia.

A. C. or D.C., normally closed or open types. High and low pressures and temperatures. PROVED AND IMPROVED PERFORMANCE IS PROOF THAT YOU CAN'T BUY BETTER CONTROLS.

35-1

FOR COMPLETE SPECIFICATIONS request new Catalog and Service and Instruction Manuals.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

1 Want to see eye-to-eye with your customers? Then sell the way they want to buy —on time payments.

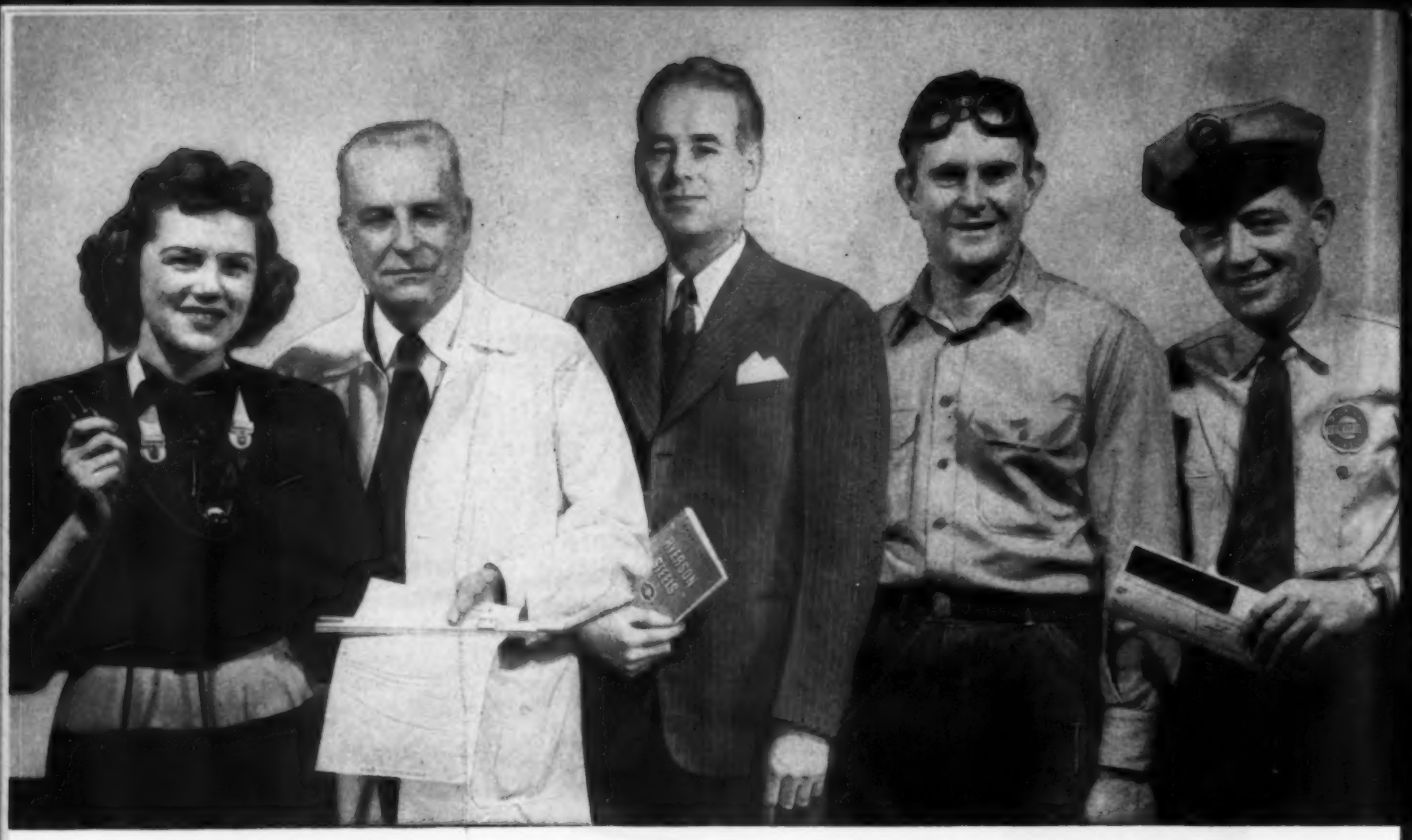
3 To make a loyal friend, a good customer, sell with ABC. Some firms have made as many as nine ABC sales to a single customer; five or six repeat sales are not unusual.

4 Don't kick business away! Don't tell anyone to go look for a loan. Prospects sent loan-hunting invariably become price shoppers. So keep your customers. Sell with ABC.

2 Here's a mighty attractive proposition for any customer: "No cash down, easy monthly payments." Offer these terms through the instalment note services of Allied Building Credits, Inc., and you follow the first rule of successful selling: "Make it easy to buy."

5 You'll never be flat on your back when you sell with ABC. You get paid in cash, you tie up no money in open-book accounts. And—ABC passes on credit and makes the collections. Our services are for the building industry exclusively.

ALLIED BUILDING CREDITS, INC.
2504 First National Bank Building
SAINT PAUL 1, MINNESOTA
Offices in Principal Cities



We're not Doing You a Favor!

In these days of critical shortages, some firms seem to consider it a favor to provide a needed product. But here at Ryerson you'll find no seller's market complex. Every inquiry is still regarded as an opportunity to serve and every order a compliment to our organization.

Prompt shipment of steel from stock is our business. When we can deliver needed steel, we're more than glad to do it. The thanks belong, not to us, but to you for letting us work with you.

That's the way we have done business for more than 104 years—through good times and bad, and that's the way we continue to operate.

Much as we'd like to handle every item on all your orders, present conditions often make this impossible. But stocks of alloys, stainless bars, seamless tubing, and many other products are in good supply at each of our twelve plants, and products or sizes out of stock today may be available tomorrow.

So contact your nearest Ryerson plant for prompt, personal service. We may not always have all the steel you need but we'll certainly do everything possible to take care of you.

Joseph T. Ryerson & Son, Inc. Steel-Service Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

RYERSON STEEL

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Head over Heels in Automatic Heat

VISITS with midwest heating and sheet metal contractors in recent weeks disclose that problems of local fuel oil scarcities, gas restrictions and the nationwide sheet steel shortage are being met with shrewd judgment. At the beginning of the fall season many contractors have an impressive backlog of heating contracts for both replacement and conversion installations. It is of interest to note that some of this business is for conversion to oil and that, in these instances, fuel for the coming winter has been assured to the customers' satisfaction by local fuel oil distributors. Dealers have been alert for opportunities to replace obsolete gas and oil equipment because these installations have provided immediate work without fuel supply problems. Replacement business has been considered desirable because it permits quick turn-over—in contrast with the delays caused by material shortages in the recent past. Thus, the dealer's ability to cope with current fuel problems is maintaining sales volume in spite of restrictions.

Steel Shortage

The same versatility is evident with respect to the sheet steel shortage. Aluminum sheets and rolls are in regular use in many shops and are being purchased and fabricated in large quantities. Aluminum has proven to be timely and an acceptable substitute for ductwork, flashings and other shop fabricated items. Its use for ductwork has served to ease the stringent sheet steel supply and remove this limitation on the sale of automatic heating equipment.

These visits substantiate business reports which disclose impressive quantities of automatic heating equipment are being sold. Today warm air heating contractors are head over heels in automatic heating. Until the current fuel situation many dealers were passive and did not wish to be responsible for servicing one fuel or another; but now, when all fuels may be in short local supply, personal opinions of a particular fuel have been abandoned and the majority have equipped themselves with the facilities and "know how" to install and service the entire system, burner and all. Thus, the warm air heating contractor's ability to recommend, install and service a suitable fuel has placed him in a commanding position in his community as a logical source for automatic heating. This is indicated by public acceptance and reflected in a recent report by the Department of Commerce. This report cites 64 per cent of the June shipments of warm air furnaces as being automatic fueled. It should be mentioned that this percentage does not take into account solid fuel furnaces converted to automatic heating in the field.

Demand for Automatic Heat

More recent reports indicate that the high percentage of automatic heating shipments is being maintained and it is the opinion of some observers that the figure would reach 90 per cent if there were no restrictive influences. But as we go into the post-war building boom, competition for the heating dollar is also booming. Panel heating, the heat pump, cooling, electric dust precipitation, sterilizing lamps and other innovations applicable to central heating systems appear as complementary or competitive influences bidding for public favor and will affect future public acceptance of our products.

Fortunately, many of these features can be embodied with warm air heating and contribute to its natural benefits. However, there is an urgent need for authoritative information and design data to meet public interest in heating advancements.

Whatever changes in design and application may become necessary, the warm air heating contractor is resolute in his belief in the underlying fundamentals of warm air heating, and so long as design and application incorporate the circulation of warmed or cooled, humidified or dehumidified and cleaned air he will contribute to its success, for these features are his heritage.

Arnold Kruckman's

Washington Letter

Administration Swings the "Big Stick"

GOVERNMENT observers, who are specialists in any line that has to do with metal, predict that the demand for equipment such as furnaces and almost anything else made of sheet metal, aluminum and similar materials will be greater during the next two years than they are even today, and they regard the present backlog of orders and the swelling demand as without parallel. Various Government agencies report that "starts" in housing units have jumped sharply in July and August. They point out that this increase is unseasonal and that the prospects are that the increase will continue to expand until late Fall. Next year is regarded as probably holding the greatest potentials for expansion in housing and other building activities in the history of the country. In addition, presuming the Russians do not upset the apple cart, it is anticipated the rehabilitation of Europe and Asia will absorb colossal totals of similar products.

Demands of Europe

One of the major problems which absorb the attention of Government people is to find the answer to the need of adequate supply for our domestic needs concurrently with the demands that will be made upon industry for the re-equipping of foreign countries, especially Europe, Poland, Germany and Greece, are almost totally ruined in a relative sense of structural units. The decimation, sheerly by freezing, the past winter has been almost incredible in Germany, Poland and other Western European countries. Oil, gas, and other fuels, as well as coal, are to be developed for their use as swiftly as possible. Heating equipment of almost any kind will be placed in communal units as rapidly as they can be adapted to the immediate needs. There is reported to be particular need for the more conventional and better types of heating equipment in Switzerland, Sweden, Denmark, Czechoslovakia, Belgium, Spain, and Luxembourg. Switzerland, incidentally, is the only other country besides the United States whose monetary unit may move in and out of its borders freely without complications. These countries, as well as some Latin American countries, are reported to have either dollars or raw materials, which are available for balanced trade transactions.

Steel Shortage Unsolved

Government observers are watching keenly the increasing use of aluminum in place of steel. The opinion here is, however, that even the recent interesting adaptations do not answer the pressing need for the solution of the problems flowing from the lack of steel. It is this conviction which has prompted Senator Edward Martin of Pennsylvania, head of the Small Business Committee of the Senate in charge of steel, to call a meeting in Washington of the principal heads of the great steel producing units on September 12. Present will be President Benjamin F. Fairless, U. S. Steel Company; Chairman Tom M. Girdler, Republic Steel Corporation; Chairman Eugene Grace, Bethlehem Steel Corporation; Chairman Ben Moreell, Jones & Laughlin Steel Corporation; President Frank Purnell, Youngstown Sheet & Tube Company; President Wilfred Sykes, Inland Steel Company; Chairman Henry A. Roemer, Sharon Steel Company; Chairman Ernest T. Weir, National Steel Corporation; President Charles R. Hook, American Rolling Mill Company; President Archie J. McFarland, Wheeling Steel Corporation; and President Hiland G. Batcheller, Allegheny-Ludlum Steel Corporation. Phil Murray of the CIO and Bill Green of the AFL have been asked to meet with the committee on September 11.

Senator Martin informed the steel people the hearing stems from the investigation into steel supply and distribution problems as they affect the interests of smaller manufacturers and users of steel. He said: "The principal subjects of investigation developed by the Senate Steel Subcommittee of Small Business in-

clude: (1) The grey market in steel, caused by diversions of steel by users and dealers, conversion deals and swindles; (2) the Historical Quota Distribution of Steel, and the iniquities of this system as it is now working; (3) Vertical and Horizontal Integration in the Steel Industry—the effects of purchases of competitors by larger, integrated steel companies, and acquisitions of steel-producing facilities by larger users of steel; (4) exports of steel—the effects of unusually large exports of critical steel products upon the domestic economy; (5) possibility of recovering steel war scrap—to augment domestic scrap and pig iron supplies; and (6) a study of steel production and capacity. *We have reached the point in our investigation where we must now ask for a frank and open discussion of these steel supply and distribution problems with the members of the steel producing community, and seek, through their cooperation, to correct and improve certain conditions.*"

Steel Supply Controls Economy

It is obvious the Government agencies, headed by Congress, are moving in to bring to a head the many troubles that have beset the manufacturers of steel products. It is the general impression in the Capital that some adjustments are urgently necessary in order to vitalize the entire economy of the nation, since every segment of industry and society is directly affected by the use of steel. The understanding is that Attorney General Tom C. Clark has in mind some action such as recently was started against eight manufacturing companies of tires and tubes, as well as the tire manufacturers' trade association and many of the officers of the various units. These companies and the association are charged with violation of the anti-trust laws in maintaining agreed prices, discounts, allowances, bonuses, classification of customers, uniform warranties, guarantees and adjustment policies, allocation of sales to state, county and municipal government agencies, limitations upon production of specified types, and other related practices. The action largely sprang from the troubles of the smaller dealers revealed in the hearings of the Smaller Business Committees of Congress. Smaller dealers, in evidence obtained by the Government in various grand jury investigations, showed they were obliged to absorb much of the price reductions, or the reverse.. Almost at the same moment the Department of Justice began its action against the rubber people, the Federal Trade Commission issued a complaint against the American Iron and Steel Institute and its 100-plus members, charging violation of the Federal Trade Commission Act, Section 5. The FTC action charged "wrongful and unlawful" combination and conspiracy to fix and maintain identical delivered price quotations and to restrain and destroy competition in the sale of iron and steel products. The old basing point system of pricing is one of the principal practices challenged by FTC. The complaint names nine principal producers and their 17 subsidiaries, who are said to produce approximately 80 per cent of the nation's total steel ingot output. *It is arresting to note that the producers named are virtually the same as those who have been summoned to the conference in September by the Senate Small Business Committee:* U. S. Steel Corp., Bethlehem Steel Corp., Republic Steel Corp., Youngstown Sheet & Tube Co., National Steel Corp., Inland Steel Co., Jones & Laughlin Steel Corp., American Rolling Mill Co., and Wheeling Steel Corp.

Complaints Against Institute

The complaint charges the companies suppress competition among each other; exchange and interchange information to formulate a common noncompetitive price policy; manipulate the markets in which their unorganized customers and consumers must buy goods. It is alleged the facts are evidenced by the action taken in connection with the increase in steel prices announced during July, 1947. It is charged the basing point system operates to insure "the same identity of delivered prices as though the industry were operating under a single basing point and as though all mills were under one ownership and control." The discrimination deprives purchasers, according to FTC, of the advantage which would accrue to them as a result of their proximity to the plants, and by requiring purchasers to pay increases over what net prices would have been had they been fixed by competition. The complaint describes a common list of charges to be added to base prices in lieu of switching, shipping and freight charges, and employed in the calculation of delivered price calculations. Price variations are avoided, according to FTC, by agreement as to "standards and specifications covering every possible variation and classification of product. From time to time, through agreement among themselves, respondents (the mills) have increased the price of 'extras' by substantial amounts aggregating a high percentage of the base price factor and without relation to the extra cost involved. The 'extras' on a multitude of alloy steel products have been increased to a point where they are several hundred per cent of the base price."

Small Producer Squeezed

The serious troubles of the smaller producer of goods involving sheet metal is brought out in many dramatic instances of the testimony before the Senate Small Business Committee, May 15, 16, 20 and 21, recently published by the Senate as Part 4 of the various hearings. Joseph Markel, president of the Markel Electric Products Co., Inc., of Buffalo, in his sworn testimony told the committee "the shortage of steel is the most serious I have known in 40 years in this business, and that despite the steps we took to avoid such a situation." At the same session another witness testified that the Edgecomb Steel Co., a New Jersey warehouse, was amply supplied with steel while the manufacturers of products were unable to get a pound. Markel told the committee that in the effort to obtain steel from Bethlehem, his concern bought 200 gross tons of scrap at $41 per ton and sold it to Bethlehem at $37.50 per ton. Mr. Markel testified his concern subsequently received some steel. Another witness, George C. Foerstner, manager, Refrigeration Division, Amana Society, Amana, Iowa, told the committee when steel was selling at the mill price of $80

(*Continued on Page* 172)

Budgets—First Aid To Profits

By Arthur Roberts

Too few dealers and contractors plan their work and work their plan, yet one essential to success in every walk of life is planning. From the cradle to the grave, it is unwise to think only of current performance; one must always cast an eye toward the future.

A budget is a business plan. Without it, a businessman cannot do an intelligent job of management. A forecast of sales, income, overhead and net profit is not difficult to construct and is readily applied to warm air heating and sheet metal businesses, both large and small. If one scans the budget of the United States Steel Corporation, the maze of figures is apt to be confusing, but like all business records, a budget must be adjusted to the scope of the business. Big business requires extensive bookkeeping systems; little business, simplified ones; but each is based on the same fundamentals. Similarly, budgets are also flexible in application; they can be simple or complex, depending upon the size of the business.

How You Can Budget

Before the war, a budget was based on the sales volume anticipated. In other words, the estimated sales volume was determined first, then the cost of sales, overhead expense and net profit were computed in ratio to the budgeted volume. Today, because of instability, the possibility of shortages making it hard to get volume, higher costs and taxes, wise businessmen are setting up their budgets in reverse. This means that the dealer or contractor bases his budget on past experience. To be dependable it must be based on adequate and accurate accounting records. In prewar years, a three year period was scanned and averaged, while today, because of instability, the period of analysis has been cut down to one year.

Say that a review of experience figures for the past twelve months shows that the ratios in relation to sales are as follows:

	Per cent
Sales	100
Cost of sales	60
Margin on sales	40
Overhead expense	30
Net profit	10

When the ratios have been determined by a review of experience figures, the next step is to estimate the overhead expense for a subsequent period in dollars and cents. Suppose this figure is $12,000, covering depreciation, heat, light, insurance, office expense, etc. If the overhead ratio to sales is customarily 30 per cent, as shown in the foregoing table, and if the budgeted overhead is $12,000, divide 30 into $12,000, which gives $400 (or 1 per cent), then multiply by 100 to get the budgeted sales volume because sales are always 100 per cent, in this case $40,000.

With the sales figure now budgeted, the business planner can easily fill in the remaining figures:

		Per cent
Sales	$40,000	100
Cost of sales	24,000	60
Margin on sales	$16,000	40
Overhead expense	12,000	30
Net profit on sales	$ 4,000	10

This is the basic formula for any period of time. If we are not satisfied with 10 per cent and wish to increase the percentage, we must deduct the differential from the overhead or cost of sales percentage and then arrive at the dollar-and-cents estimate. If 10 per cent net profit seems too much, the procedure is reversed. No counsel can be given as to desirable ratios. This is entirely up to the dealer or contractor to decide, based upon a review of experience records and the budget-maker's judgment as to reasonable income, overhead and net profit.

When determining the overhead expense in dollars and cents, we should consider not only the outlay for a prior period, but any changes that future plans may make in the figure. Every sensible businessman has a fairly good idea of what he intends to do in the way of future activities, so he adjusts past figures on overhead accordingly.

Business Control

Based upon budgeted overhead expense, the budget-maker will arrive at a sales figure that can be used as a guide to profitable operation in a subsequent period. The businessman with $12,000 overhead expense, desirous of earning 10 per cent net on sales, and whose ratios, as shown by experience figures, are those of the foregoing tables, knows that to attain his

objective he must do $40,000 in volume, so his mind is focused on this volume throughout the period as well as the budgeted figures for all operating elements that offset sales. His business operations are conducted according to a plan based on his own experience figures, which is better than operating hit or miss.

The formula so far shows how to get budgetary figures for an entire period. The figures should be broken down monthly and checked monthly, comparing estimated figures with actual results. Sales volume varies during the year with consumer demand, seasonal business, promotional effort, etc. For example, if January sales for a period in the past were 3.5 per cent of total sales, then the current budget is set up accordingly for January, and so on, for every month in the year. Suppose that prior-year figures showed that monthly ratios were as follows:

		Per cent
January	$ 1,750	3.5
February	1,600	3.2
March	2,500	5.0
April	3,050	6.1
May	4,750	9.5
June	5,300	10.6
July	5,000	10.0
August	5,700	11.4
September	5,750	11.5
October	6,500	13.0
November	4,600	9.2
December	3,500	7.0
Totals	$50,000	100.0

When budgeting for a subsequent period, a business planner would be guided by these ratios in setting up monthly quotas, making, of course, whatever adjustments he believes necessary in line with his judgment of sales to come. The monthly percentages are multiplied by the total sales estimated to get the monthly sales figure in dollars and cents. To get the monthly figure for cost of sales, overhead and net profit, use the ratios in the foregoing tables, otherwise your experience figure ratios. For example, based on a January ratio of 3.5 per cent of total volume and a budgeted total of $50,000 a year, the estimated figures for January would be:

		Per cent
Sales	$1,750	100
Cost of sales	1,050	60
Margin on sales	$ 700	40
Overhead expense	525	30
Net profit on sales	$ 175	10

Budgets Are Flexible

The dealer or contractor cannot expect to match estimated with actual results each month or for the year as a whole, but the budget will give some semblance of business control. The fact that there may be a big difference between the estimated figures and actual results does not negate the value of a budget as a check on operations. All budgets require a certain degree of flexibility and the figures set at the beginning of a period may be changed if conditions warrant.

Budgeting may start any month and usually covers a year. If a business year ends in December and a business planner starts budgeting in June, estimates should be forecast to December and budgeted from January to December thereafter; the budgets being kept in a looseleaf binder for comparative analysis so that the dealer or contractor can determine the accuracy of his forecasts from period to period. At first, budgetary estimates may vary widely from actual results, but with the passing months and close attention to the figures, it will be possible to do a better job of forecasting.

Plan Income and Expenses

Some businessmen assume that because their business operations are complex in certain phases, budgeting is impossible, but this assumption does not meet with the experience of businessmen in general. Many concerns producing hundreds of different products prepare budgets annually. One weakness among warm air heating and sheet metal contractors is lack of budgetary preparation, and this laxity will prove more costly in this postwar period than in prewar years because, aside from other important considerations, the income tax is much higher today. This heavy fixed expense increases with profitable volume, hence, the taxpayer should plan income and outgo beforehand to get a perspective of his spendable income after the tax is deducted.

Because of variables and uncertainties, operations will be harder to forecast today than in prewar years, but this is no reason for not budgeting; in fact, it is all the more reason for budgeting. "I don't know what tomorrow will bring, so how can I budget for an extended futurity?" is the gist of the argument against budgeting. Such objectors do not understand the underlying reason for a budget. Its purpose is to provide a springboard from which to get a perspective on future operations. Even though the going may be rough and unpredictable, a compass is essential to a mariner, needed more in turbulence than in calm.

Profits Assured

In checking over our survey work sheets covering prewar operations in many fields, including this industry, we find that 90 per cent using budgets made or exceeded anticipated profits, 10 per cent dropped below anticipated profits by an average of only 8 per cent, and none lost money. Of those not using budgets, only 30 per cent made or exceeded anticipated net profit, 45 per cent did not make the net profit hoped for, the deficiency averaging 22 per cent, and 25 per cent lost money, even though they used a pricing formula that looked profitable on paper. It is only reasonable to conclude from these field studies that budgetary control in prewar years was essential to the attainment of maximum profits, and certainly if such business control was needed in a calmer day, how much more imperative is its use in this postwar period when business is being "needled" by labor unrest, higher costs and taxes, international disturbances and general instability. The wise sheet metal contractor and warm air heating dealer will play it safe during this postwar period with a budget based on costs rather than on sales.

Are Profit Sharing Plans A Substitute for Pensions?

By George B. Buck
Consulting Actuary, New York City

ANYONE who would answer "yes" or "no" to the question of whether profit sharing plans are a substitute for pensions would be speaking very generally, and speaking very generally, my answer would be "no"!

If an employer pays high salaries to his employes and they save for old age, one may argue that the payment of the high salaries is a good substitute both for a profit sharing plan and a pension plan. One student of pensions has said that the best pension plan is no pension plan as such, but one which results indirectly when all employes are paid good salaries, are thrifty and provide for their own old age. But this theory does not work successfully in practice. Some people will not save, no matter what their salaries may be. Others do not get incomes which will permit savings, or are unfortunate in their savings; so we have Social Security laws, old age pension laws, and other means of providing a minimum subsistence in old age.

In this article I am not considering public pensions, which are paid for social reasons, but I am considering the problem of the individual or corporate employer who is faced with a decision as to whether a profit sharing plan will make unnecessary the establishment of a staff pension plan for his organization.

Business Basis

To my mind, both profit sharing plans and pension plans are fundamentally based on enlightened selfishness, and not on charity. If an employer pays salaries and profit sharing allowances, or pensions in any form, totalling more than the value of the service he receives, he must charge more for the product he makes than it is worth in order to avoid a deficit, and then he cannot meet competition. It seems evident that an employer is not going to adopt either a pension plan or a profit sharing plan unless he knows that his business is going to benefit thereby. A profit sharing plan or a pension plan must pay its way to justify its operation.

My concept of the purpose of a staff pension plan was expressed by a conservative old school teacher who had passed his three score and ten years and was addressing a statewide gathering of school teachers. He said, "Now, teachers, you must always remember that our teachers' retirement system was not established for the benefit of school teachers. There is no more reason why a teacher in our state should have a pension than the butcher, the baker, or the lawyer living in your town, who also pays taxes. The only justification for these men supporting your retirement system is that it will result in their children having better teachers in return for the taxes they pay for the educational system."

This old teacher had faced the arguments of many county school boards, who had looked upon the retirement plan as something the teachers had forced on the public. His position was that without a retirement system, the educational system, as employer, would be forced to carry on the pay roll hundreds of disabled and superannuated teachers who could not teach and who did not earn their salaries. He had heard all sorts of arguments about dismissing such teachers, but the taxpayers, that is, the butcher or the baker or the lawyer, would not countenance letting out the old teacher who had taught them when they were in school if they knew that she had nothing to live on and had lost her health or become too old to teach.

If one took his pencil and honestly figured how many such teachers would remain in active service if there were no retirement system and how much they would draw in unearned salaries, he would see that a conservative retirement system would actually reduce the ultimate school budget, rather than increase it. He would see that the taxpayers could support a retirement system without increasing the total cost of education and at the same time would have teachers capable of teaching.

A similar condition exists in business. Individuals or corporations are normally not in a position to discharge disabled or elderly employes who have served them for many years; and as a corporation becomes older, the increasing number of such employes makes necessary a systematic program for dealing with them.

Organized Program

The payment of pensions may begin in a most informal way, but as time goes on and the employer gains more knowledge and experience with the problem, he finds that for the protection of his business he is forced to adopt a properly constituted pension plan. An employer may feel that he is paying salaries above the average and that his employes should save and provide for their own old age. No one can dispute this argument, but unfortunately many employes will not appreciate this philosophy and the employer will still have a retirement problem on his hands when they reach old age.

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To protect himself he must face this situation and make such arrangements that, regardless of the thrift or lack of thrift among his employes, he will not be placed in a position where he cannot dispense with the services of an employe in the event of disability or old age, without having the public, or the younger employes at that time, advertise him as a ruthless or unfair employer.

Profit Sharing

A profit sharing plan does not serve the same purpose as a pension plan. Fundamentally, its purpose is not that of protecting the employer against loss from disability or superannuation of employes, but is for the purpose of offering greater reward for greater effort and for successful business results. Despite current temporary evidence to the contrary, the enlightened employe knows that unless the business of his employer is successful, he cannot expect increases in his compensation. The profit sharing plan defines the increase which he may expect as the result of increased business success or of greater efforts on his part, but it does not protect the employer against the effects of superannuation or disability.

Suppose an employer is debating whether to install a pension plan or a profit sharing plan. Suppose he feels that he could set up a profit sharing plan and, under normal conditions, the plan would result in distributions to employes amounting to about 5 per cent of the pay roll; or that he could set up a pension plan and make the same contributions, but that he is not prepared to adopt both.

If he sets up the profit sharing plan, it may act as an incentive to greater effort on the part of employes, just as the prospect of increased salaries. If he sets up a pension plan which will hold out to employes some security in their long term future, would not the effect on employes' morale be somewhat similar? But if he sets up the profit sharing plan, can he distribute the money so as to solve his retirement problem also?

Suppose the employer has three employes, each receiving $2,000, one who is age 25, another age 45, and the third age 65. Let us assume that under the profit sharing plan they would share about equally if their positions were about the same. Such a plan, if the benefits were deferred, might provide a reasonable income upon retirement to the man age 25; a smaller income for the man age 45; but practically no income for the man age 65.

Would the employer not, therefore, still be faced for many years with the problem of how to treat old and disabled employes? Suppose that the distribution under the profit sharing plan gave weight to years of service as well as to salary. To secure the approval of the Bureau of Internal Revenue, the distribution under a profit sharing plan must follow a definite formula, such that distributions per unit of salary do not favor the higher paid. It would be difficult to allocate the profits on a basis to be approved by the Bureau of Internal Revenue, and at the same time enable the man close to the retirement age to have an adequate income for retirement.

On the other hand, a retirement plan almost invariably recognizes service prior to the date the plan becomes effective and provides pensions based on such service. The employer's prior service contribution takes into account the relative ages of employes and the cost at each age of providing the prospective benefit. If an allocation on a similar basis should be attempted under a profit sharing plant, taking into account the cost of pensions to begin, say, at age 65, the profit sharing plan would lose its character as such and partake of the nature of a pension plan. It would then probably not be approved by the Bureau of Internal Revenue as a profit sharing plan.

It would seem, therefore, that the employer who must choose between a pension plan and a profit sharing plan would better protect his business by using the funds available to finance a pension plan which would permit the retirement of his older employes, open the avenues of promotion to younger employes, and permanently relieve him of the problem of old age and disability among his employes.

It is our opinion that the operation of a pension plan need not involve an employer in any greater long time commitments than he would have had under a profit sharing plan, and, over a period of time, he is in a far better position with a pension plan than with a profit sharing plan and no pension plan.

Limiting Commitments

In certain instances when an employer has wanted the advantages of a pension plan to take care of the problem of superannuation, and at the same time has wished to make the minimum commitment under a pension plan, a pension plan has been established to provide a minimum or basic benefit, and a profit sharing plan has also been established under which supplementary contributions were made to provide additional benefits at retirement. In such cases a minimum basic pension accrues each year. Then, in years when there are profits, additional contributions from profits are made and credited to each employe's account.

If the employe stays in service until retirement, these additional contributions, with interest, are used to provide a supplementary annuity which is paid in addition to the basic pension under the plan. This protects the employer, inasmuch as definite provision is made each year for the basic pension. It is popular with the employes, inasmuch as in years of good earnings additional savings are set aside for use in augmenting their basic pensions.

My office does not advocate any particular type of pension plan or profit sharing plan. We have been consulted not only on pension plans but also on profit sharing plans many times during the past quarter of a century. During this period we have seen some of our clients discontinue profit sharing plans in favor of pension plans, we have seen those with pension plans establish profit sharing plans, those with profit sharing plans establish pension plans, but we have never had a client discontinue a pension plan for a profit sharing plan.

My conclusion is that increases in salary are fine; that profit sharing plans are fine; but that neither serves the purpose for which a soundly constructed pension plan is created. A company can function successfully without a profit sharing plan if it has a retirement program, but thus far the profit sharing plan alone has generally not proved sufficient.

Horse And Buggy Building Codes

While the building codes in this country have been the subject of much abuse and unfavorable comment little has been done to correct the situation. The code system now in use in England is discussed here as a possible means of introducing into our codes the flexibility that is sadly lacking.

THE antiquated building codes that govern construction in this country have been the subject of much discussion for many years. It has been pointed out that not only towns and villages are guilty of neglect, but many large and supposedly progressive cities are just as far behind the times. At this time, when the need for housing is acute, it is incredible that any community would allow out-of-date and needlessly restrictive building codes to curtail the number of houses that must be erected to meet its needs.

There has been an apparent tendency to forget that the original purpose of the building code was to protect the community by assuring safety of construction and not to perpetuate traditional building trade practices. This is not intended to imply that all codes are restrictive and should be immediately revised to permit any experimental materials and methods that may be suggested. But neither is it progressive to assume that because a house has been constructed in a certain fashion that there will never be a better means of building a house. The code must be alert to change and ready to incorporate the new method when it has proven its worth.

In England there is current a different idea of the purpose of a building code from that which we hold in this country. There a code that is in preparation is being written by a committee which is developing a "statement of good practice" that is advisory and designed for voluntary adoption by all communities. The Codes of Practice Committee for civil engineering, public works, building and constructional work was formed for this specific task in 1942 and has been functioning ever since.

Plan of the English Code

In a publication of the National Committee on Housing, Inc., "Tomorrow's Town," Mr. Colin Lucas of the British Commonwealth Scientific Office has discussed the way in which the English planned their code. He says, "In order to make a clear distinction between *performance standards* and *specific techniques*, the code was divided into two parts—a 'Code of Functional Requirements,' which deals with the standards of performance required for buildings and parts of buildings, and a 'General Series' of Codes dealing with specific materials and methods."

By setting the codes up in this fashion the committee has been able to lay down certain rules and regulations, as far as design practice is concerned, in the Code of Functional Requirements and then to specify the exact way in which these standards may be met through application of materials and methods according to the General Series Codes. Moreover, this system lends a very valuable flexibility to the Codes; for, when authorized tests have proven that a new technique is worthy of inclusion in the building codes, by the fact that it meets the standards of performance set up by the "Functional Code," then it can be accepted as adequate and if necessary a new code can be written to include it in the "General Series."

In this way sections of the codes can be revamped from time to time without the need for re-writing the entire code. That is one of the difficulties with our codes as they are now constituted. It requires such an involved process to include new materials and techniques into their structure that the entire thing is allowed to go on untouched until it needs a general overhauling. Perhaps if the two sectional code system had been used in this country in years past there would not be so many antiquated building codes on the books in our cities and towns.

The Zoning Question

One point arises in the English codes that seems to be at variance with belief and practice in this country. Rather than rely on zoning regulations as a means for setting standards in regard to layout and spacing of buildings as well as standards for light and air, space and fire protection, the committee in England went on the assumption that any building could be erected anywhere so long as it did not endanger neighboring buildings. The reasoning on which this was based was the fact that if the codes were to be in effect for any great length of time, who would be able to predict the way in which any neighborhood would develop or deteriorate in the years to come. The logic of this approach seems to be rather sound, and perhaps some thought should be given to it in this country.

'Definition of Standards

In the process of the work on their codes the English committee encountered the question as to just what standard they were seeking to meet. After much discussion they decided that the closest that they could come to a definition was "A desirable standard of good

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NEWS SUMMARY OF THE MONTH

Warm Air Furnace Shipments

SHIPMENTS of warm air furnaces in June, 1947, reported by the Department of Commerce, totaled 55,235 units. This represents substantially no change from the 54,864 units shipped in May this year.

About 80 per cent of the June shipments were steel construction and the remaining 20 per cent were cast iron.

Distribution by type of fuel was as follows:

Fuel	Number	Per cent
Solid	20,187	36
Oil	25,372	46
Gas	9,676	18

Shipments for the first six months of 1947 totaled 368,437 units compared with 264,713 for the same period of 1946. Forced air furnaces accounted for 204,019 of the units shipped this year, and gravity, 164,418.

Distribution by type of fuel for the first half of 1947 was as follows:

Fuel	Number	Per cent
Solid	139,948	38
Oil	127,268	35
Gas	101,221	27

Slab Floor Research

THE most economical way to build a dry, comfortably warm concrete-slab floor in a basementless house will be studied at the University of Illinois, where 10 different types of concrete-slab floors will be tested for temperature variations and moisture conditions. The study will be under the direction of Prof. S. Konzo, nationally known heating authority. Results will be published by the university.

For purposes of the experiment, a one-story, windowless building, 75 feet long and 16 feet wide, will be built. This will be divided into a series of small cells or rooms, each of which will have a different type of concrete floor. Some of the floors will be laid directly on the ground without any insulation; some will be "floating foundations" (like sidewalks); others will have gravel, cinder, or other types of insulating materials under the concrete.

Each room will be insulated from adjoining test cells; each will be heated electrically, and each will house instruments for the measurement of floor temperature and moisture conditions.

Testing of moisture conditions will begin as soon as the building, which now is under construction, is completed. Temperature tests will be started in the fall and will be carried through one complete heating season.

Construction Materials Improve

IN the first half of 1947 the supply of most construction materials continued to improve mainly because of high levels of production, the Department of Commerce reports. A composite production index indicates that the average was 19.1 per cent above the same period in 1946, and 5.4 per cent above the monthly average for 1946 as a whole.

As compared with monthly average production in 1946, the larger advances registered during the first half of this year included hardwood flooring, softwood plywood, clay sewer pipe, cast iron soil pipe and fittings, gypsum board, asphalt roofing materials, wire nails, cast iron radiation, steel conduit, warm air furnaces and water heaters.

Exports of 13 construction materials rose along with production in the period. Exports of all 13 materials increased in actual quantities. Although part of the increases can be attributed to the gradual relaxation of export controls beginning early in 1947, exports of materials remaining under strict control also increased. Despite the increases, exports of 11 of the 13 materials represent relatively small percentages of total production.

There are a few materials for which supply has not caught up with demand. For example, sheet steel continues very short, the report points out.

"Since there is every reason to believe that the current high rate of output for most materials will at least be maintained during the rest of the year, area shortages should diminish," the report states. "Sheet steel, however, is likely to continue tight."

Heavy Industries Busy

RAILROADS and utilities are leading the parade of expenditures for new plants and equipment in the third quarter this year, in which American business improvement plans call for capital investments of $3¾ billion. That exceeds last year's expenditures by $400 million for the same period, but most of the expansion of our productive capacity is accounted for by the improvement programs of the railroads and utilities. Capital expenditures by manufacturing and commercial establishments are comparable with 1946 in dollar volume, but less in physical volume.

Retail Heating-Plumbing Sales

IN its U.S. summary of retail trade, the Bureau of Census reports a 32 per cent increase in the sale of heating and plumbing equipment for June over the same month in 1946. For the first half of this year sales were 34 per cent higher than the same period of 1946. June sales exceeded May by 3 per cent.

Disabled Veteran's Allowances Increased

AUTOMATIC increases in the minimum allowances received by the more seriously disabled veterans enrolled in educational and training courses under government sponsorship were effective September 1.

The increases, voted by the last session of Congress and signed into law by the President, will be reflected in September checks received on or after October 1.

The new law provides that a veteran trainee with disability rated 30 per cent or higher will receive $115 per month if he has no dependents, and $135 if he has one dependent. The old law allowed $105 and $115 for the same categories and will continue to apply to veterans with disabilities rated less than 30 per cent.

According to the Veteran's Administration, the new law does not change the basic provisions of the Vocational Rehabilitation Act except for the increased allowances to the more seriously disabled veterans.

Apprenticeship Training

EVER since the war one of the two problems facing the building construction industry has been the lack of sufficient mechanics and a severe shortage in the number of apprentices being trained. In the last few months, however, apprentice training programs have been speeded up all over the country with the result that as of the last two months many cities are showing remarkable apprentice training programs.

For example, in Atlanta, Georgia, some three thousand building construction apprentices are now in training following a model apprenticeship training program. In Los Angeles, the prewar ratio of one apprentice to eight journeymen has been raised to one to four and a record breaking 7,730 apprentices are now in training in the various building crafts. In Chicago almost 5,000 apprentices are in training, and an additional 4,000 men chiefly veterans with building trade skills have been qualified as journeymen on the basis of their abilities and are now at work. During the last year 15,000 such men joined the ranks of Chicago's journeymen builders. In Detroit, enrolled apprentices total more than 2,000 and some trades in Detroit are laying plans to take on as many as 1,000 apprentices in a particular craft.

Denver reported recently 600 apprentices in training; Dallas reported 750 apprentices; Boston has more than 2,000 apprentices in training at the moment.

If these examples are typical of what is going on all over the country, then within a relatively short time these apprentices will be sufficiently skilled to add materially to the working force of the construction industry.

G.I. Sheet Metal Workers

TWENTY per cent of all veterans taking on-the-job training under the G.I. Bill are learning trades and skills in the construction field, according to the Veterans Administration.

A sampling of the 619,000 ex-servicemen enrolled in job training courses revealed that 115,905 were distributed in the construction field. It is estimated that 10,402 are enrolled as tinsmiths, coppersmiths and sheet metal workers.

The length of job training to which an eligible veteran is entitled depends upon his period of active military duty. He receives one year plus one month for each month of military service with a maximum of two years, except in the case of apprenticeships which may extend as long as four years.

While in training, he may receive a subsistence allowance from the Veterans Administration up to $90 a month if he has dependents or $65 a month if he has none. However, his total earnings, including subsistance, are limited to $200 a month (with dependents) or $175 a month (without dependents).

Half Year Construction Figures

CONSTRUCTION volume, as measured by contracts awarded in the first half of 1947, was 11 per cent below that for the same period last year in the thirty seven states east of the Rocky Mountains according to a F. W. Dodge Corporation report.

Residential construction fell off 10 per cent and nonresidential contracts were down 23 per cent, while public works and utility awards showed a 9 per cent gain.

Total construction contracts were valued at nearly $3½ billion which was about $550 million less than the first six months of 1946.

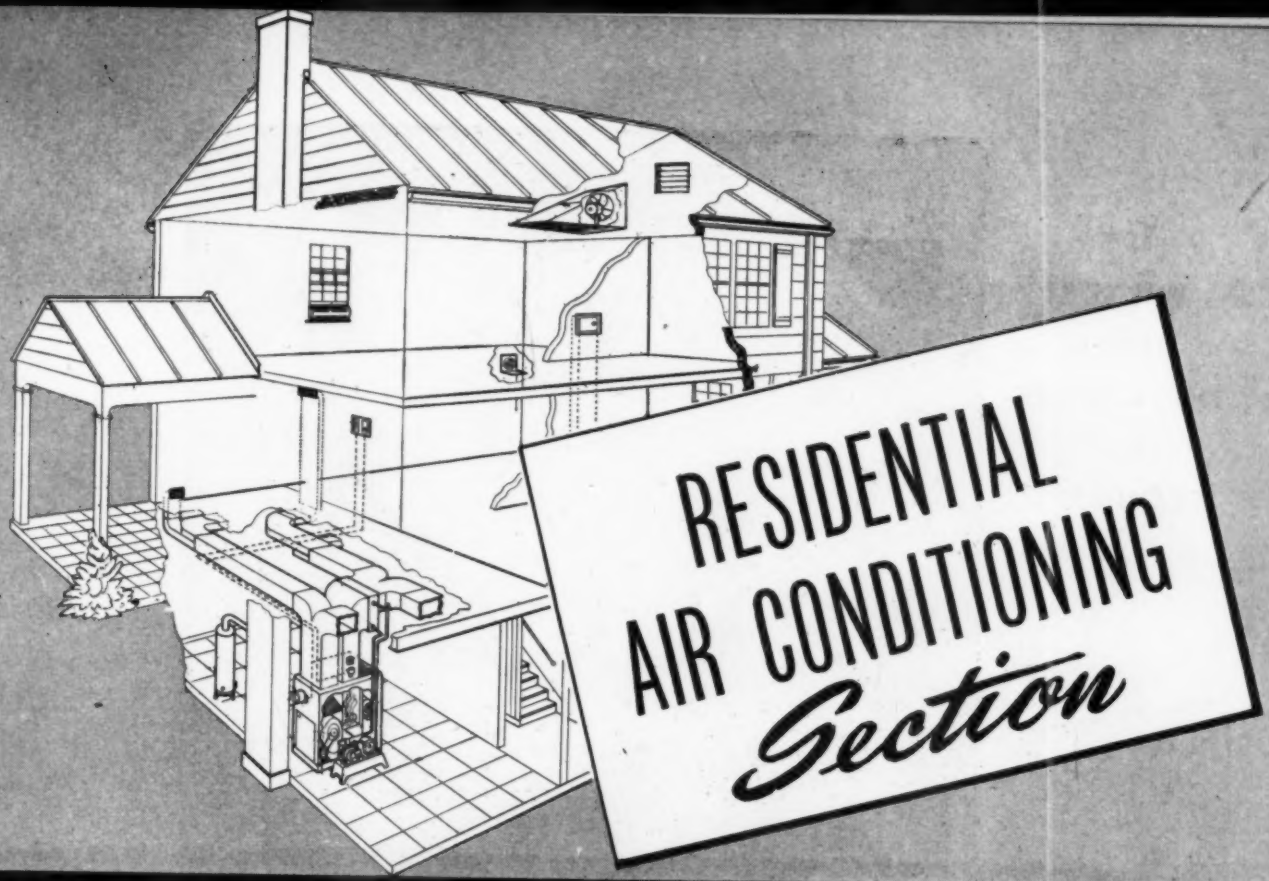
Residential volume totalled $1,468,902,000 against $1,633,473,000 in the same period last year.

Fire Prevention Week October 5-11

THE IMPORTANCE of fire safe heating equipment is revealed in a summary of principal causes of fire issued by the National Fire Protection Association. The annual toll of fires caused by defective heating equipment is listed as 45,000 and by defective or overheated chimneys and flues, 40,000.

Fires occur in 760 homes every day, or about one every two minutes. As a measure of fire prevention, heating equipment should be kept clean and in good repair and nearby combustible surfaces protected.

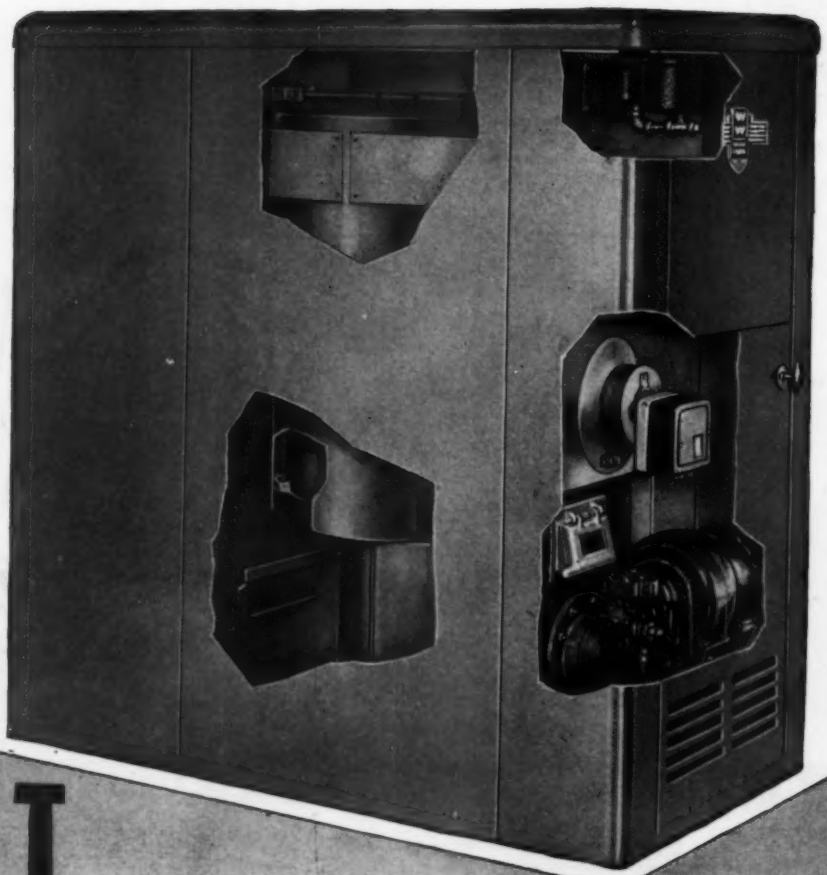
The association suggests Fire Prevention Week gives us a chance to get in some extra licks in the daily battle against fire.



RESIDENTIAL AIR CONDITIONING *Section*

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

IT'S WHAT'S UNDER THE CASING THAT COUNTS !



Waterbury

Oil Fired Air Conditioner

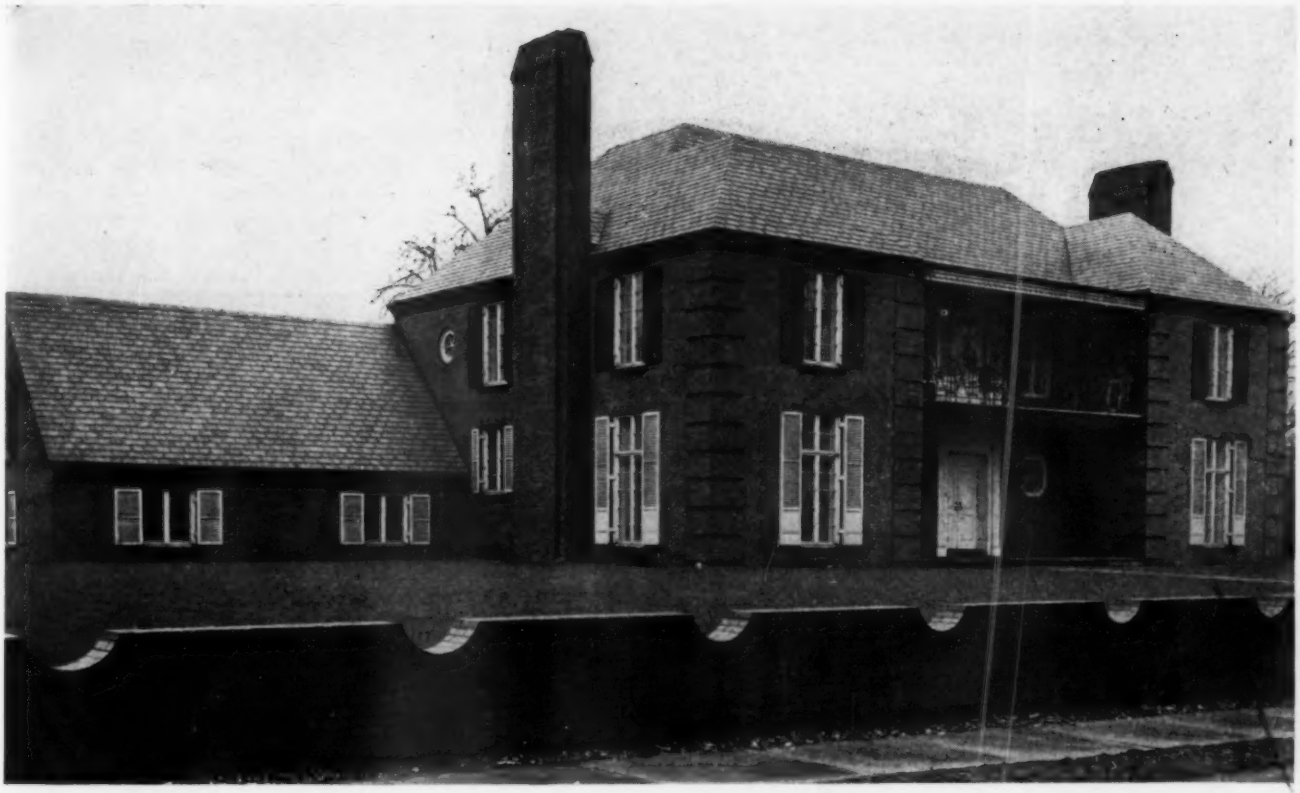
Whether you are installing a simple gravity job or the most complete air conditioner, it's what's under the casing that counts for your customer's satisfaction—and for a trouble-free sale for you.

A modern, compact, attractive unit, economical to buy—economical to operate. It is enclosed in an eye-appealing casing that is a compliment to the most modern basement—but what is equally important to you—because of the efficiency and quality of what is UNDER that casing, you are saved annoying service calls.

Furnaces for every size home and every type fuel—
from gravity models to complete air conditioners.

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E. **Minneapolis 13, Minn.**

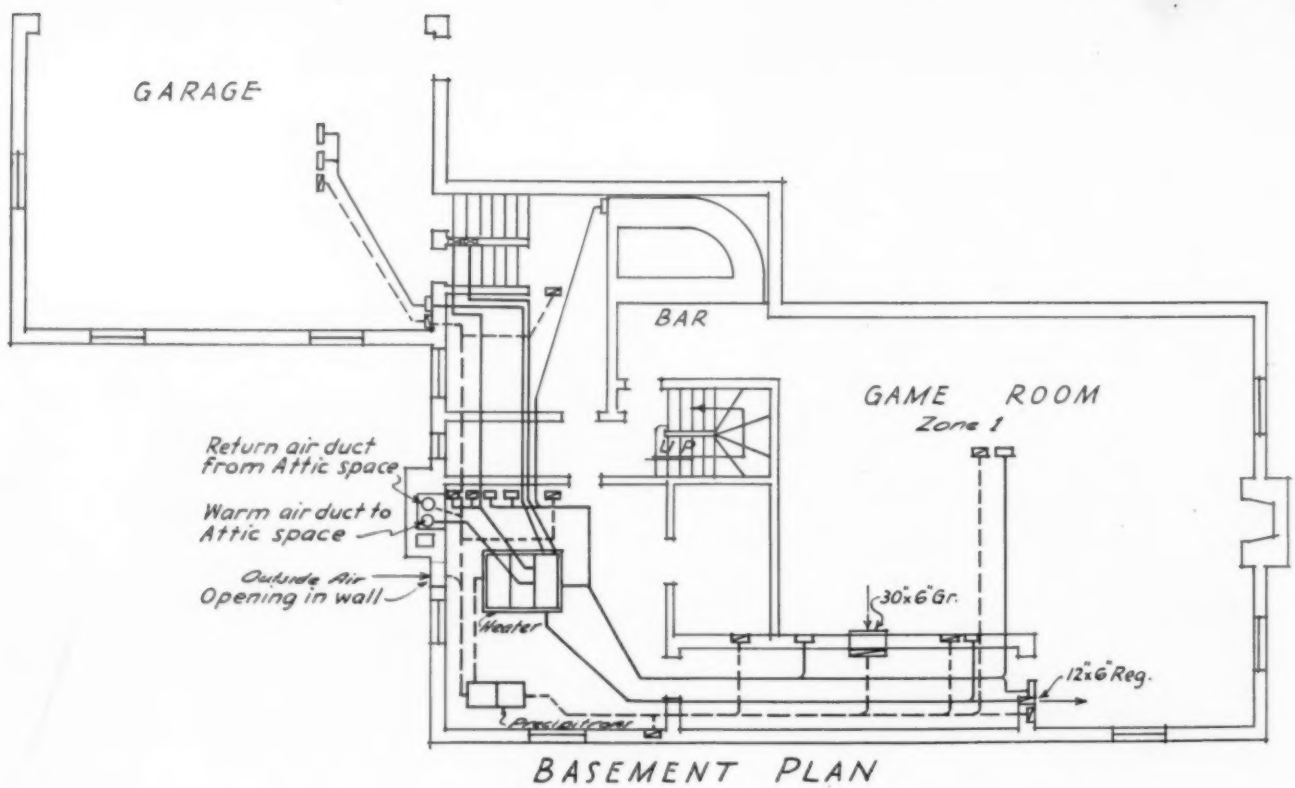


Electronic Devices Produce Pure Air

What does the warm air heating industry offer that is new in the post-war period? At a time when the free for all for the consumer's dollar is getting underway, it is opportune to survey our advancements because the consumer is expecting new things. This article describes equipment that cleans and purifies air for use with air circulating systems. Electric dust precipitators and sterlizing lamps are not new, but the war postponed civilian use.

THROUGH seven years of winter and summer operation of a winter air conditioning system the walls, rugs and furniture of the Joseph Fingeret home, Sewickley, Pennsylvania, have never been redecorated or cleaned. According to W. J. Keist & Son, heating contractors of West View, Pittsburgh, Pennsylvania, this has been gratifying performance and represents a considerable saving in a locality where walls are normally cleaned about twice a year, and curtains and drapes about once every two months. Although the Keists installed the system in 1939, electric dust precipitators and sterilizing lamps were included in the original installation, refinements which even today may be considered an innovation. The house being long and consisting of twelve rooms, seven temperature zones, each with an individual thermostat, insure that warm air will reach the most distant rooms. The system embodies all the equipment necessary to clean, humidify, sterilize, heat and circulate air during the heating season, and clean, sterilize and ventilate in summer.

The house is completely insulated and equipped with storm doors and windows, the calculated heating load being approximately 140,000 Btuh. A Westinghouse gas-fired winter air conditioning unit rated: 212,000 Btuh input, 169,600 output, 2400 cfm blower with ½ hp two speed motor, was installed in the basement as



shown in the house plans. Two Westinghouse Precipitrons rated 1200 cfm each, twelve Sterilamps, seven reversible summer-winter room thermostats and duct damper motors and automatically controlled humidifying equipment complete the impressive list of apparatus installed.

Unusual Installation Features

An unusual feature shown in the house plans is the manner of running the supply and return ducts to zones 5 and 7 up inside the furnace chimney. In the attic both ducts continue across the floor to the vicinity of the north second floor rooms where the supply is divided and branched to the rooms of each zone. This method was necessitated by the desire to keep the duct-work in the basement game room to a minimum.

All supply registers are located on the high side wall and the return air grilles in the baseboard.

A screened and louvered fresh air intake in the south wall in the basement, adjacent to the heating equipment, is joined with the return air main from the rooms by a dampered duct which may be adjusted to provide approximately ten per cent outside air in winter as a means to reduce infiltration, or opened so only outside air is circulated in summer.

Seven temperature zones reduce the over-all heating problem by dividing the house into seven small problems. Complete flexibility to furnish whatever temperature is desired in any zone is assured. This flexibility is readily observed from the zoning arrangement:

Zone	Rooms
1	Basement game room
2	Living room, dining room, den, reception hall and breakfast nook
3	Bed room No. 1, dressing room and bathroom No. 1
4	Bed room No. 5
5	Bed room No. 2, bed room No. 3 and bath room No. 2
6	Maid's room and maid's bath room
7	Bed room No. 4 and bath room No. 3

In winter a temperature drop in one or more zones opens its zone duct damper and starts the burner. A two speed blower control is adjusted to operate the blower at high speed when the plenum temperature is above 110 F and at low speed when less than that temperature. Thus circulation is continuous regardless of heating cycles. By throwing a switch in the basement control panel, each room thermostat in the seven zones can be reversed to operate the blower at high speed for summer ventilation upon a temperature rise in any one or more zones.

Arrangement of the Precipitrons

The Precipitron units were placed in tandem so one duct connection serves the two. Return air from the rooms and outside air pass through the units before entering the furnace. The photograph shows the duct connections, the return and outside air entering through one duct at the left and leaving the filters through the vertical duct connections at the top of each where they connect with the large duct which conveys the cleaned air to the blower connection on the furnace.

The precipitators are so built that dust, smoke and soot carried into the system must pass through a high voltage electrical field where they receive a positive charge and then pass through a secondary field of op-

posite polarity. The opposing polarity attracts the airborne particles causing them to precipitate or drop on plates where they may be flushed down the drain with water.

The voltage required for the operation of an electric dust precipitator may be obtained by stepping up commonly available voltages with a transformer. Also, alternating current is converted into direct current, and since voltages within the unit are high, provision is made to open the electrical circuit whenever a servicing door is opened.

Sterilamps Arranged in Banks

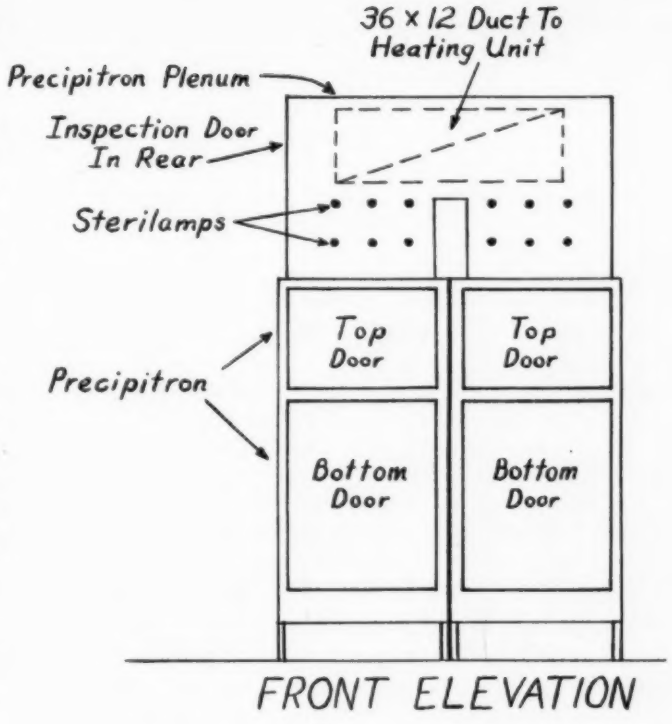
The sterilizing lamps are installed in the return air duct on the leaving side of the dust precipitators. They are so placed that the air must pass through a bank of lamps as indicated in the figure. A duct with a 36-inch dimension is necessary to accommodate lamps of 30 inch effective length. Thus the distance between the socket supports is 36 inches and the sockets for each lamp are installed directly opposite each other on the duct walls.

Since the life of each lamp is approximately six months, Keist provided a plate glass service door to facilitate inspection without opening the service door.

Their electrical requirements are 110 volts, 60 cycles alternating current and suitable control equipment to turn them on whenever the blower operates.

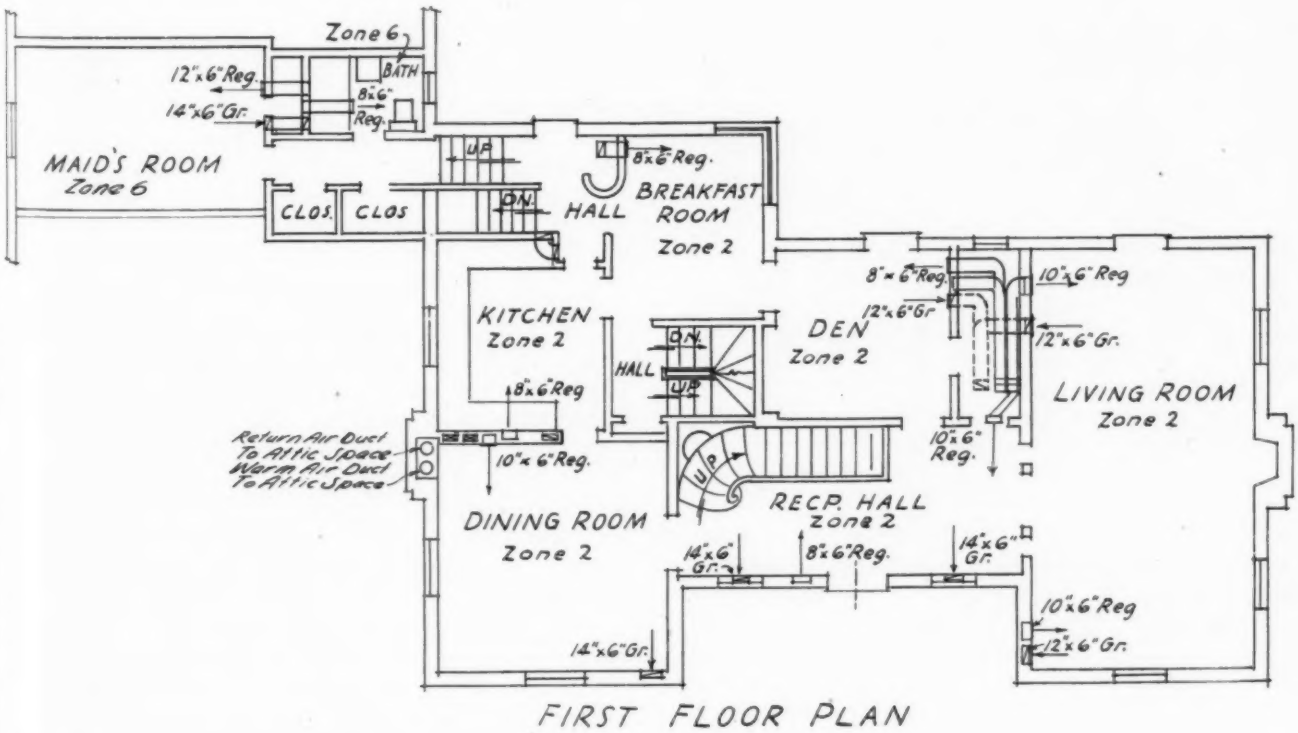
Ultra-Violet Arrests Contagion

The benefits from sterilizing or ultra-violet lamps when used in residential air conditioning systems are not as readily discernible as those from heat, air cleaning and humidity. In recent years their use in hospitals, schools and nurseries has increased, and compara-



The drawing above shows the arrangement of the Precipitrons and the Sterilamps, also showing provision made for inspection and replacement of the bacteria-killing lamps.

The floor plan below, along with the other plans on these pages, illustrates the size of units installation and careful planning which went into the job.



tive records of the incidence of infection indicate important improvements from their use. The ASHVE Guide, 1947, cites the following, "Ultra-violet radiation of floors and upper air has been studied extensively at the Naval Training Center, Sampson, N. Y. In barracks housing naval recruits, hospital admissions for respiratory infections (mostly *catarrhal fever*) were 25 per cent lower in a group of men exposed to ultra-violet radiation. . . . Than they were in adjacent control barracks without ultra-violet radiation. A combination of ultra-violet radiation and dust control measures is believed to be more effective than when either one of the two is used alone, but the proof for this is yet to come."

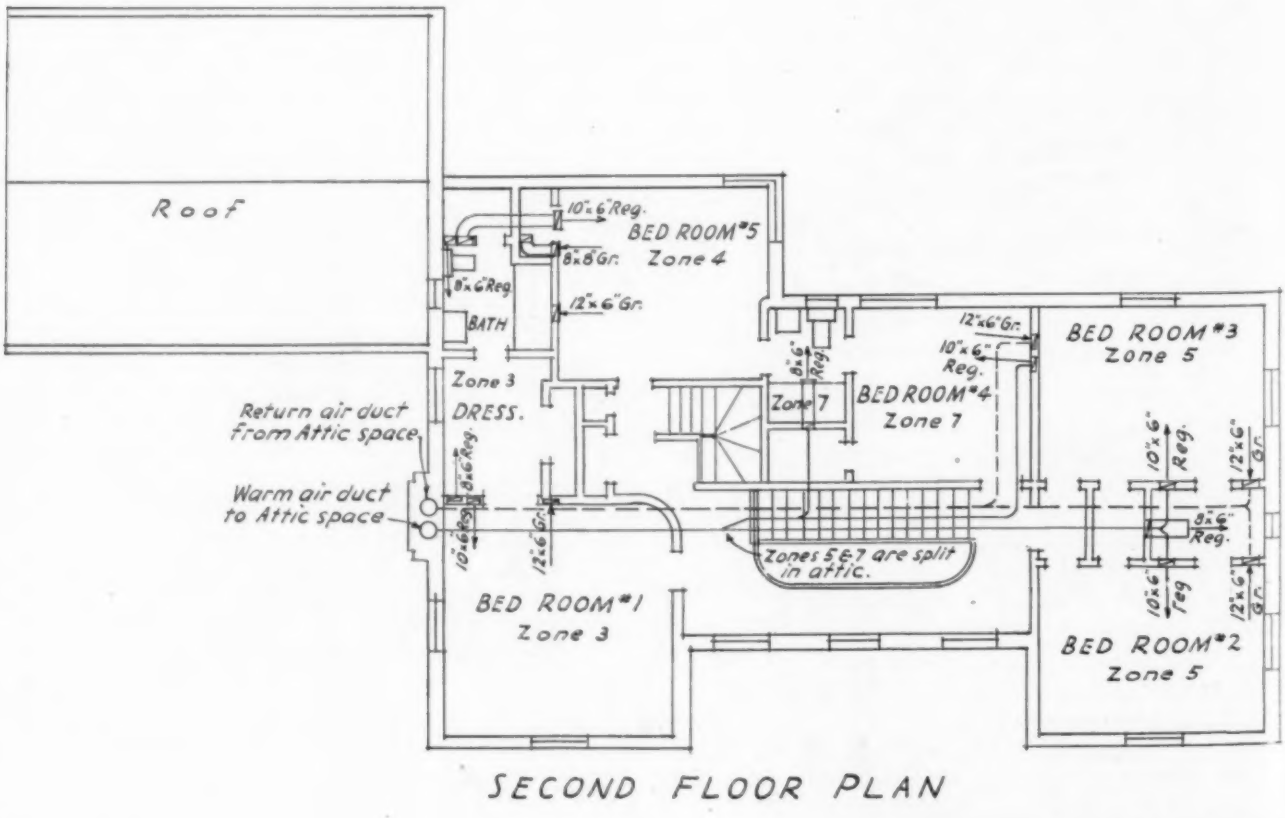
While these lamps have not yet become popular in residences, the annual increase of the incidence of infection from airborne bacteria during the winter months is sufficient reason to arouse public interest for their power to destroy micro-organisms such as germs, bacteria and mold has been demonstrated.

Other Similar Jobs Sold

At the time of installation this job was experimental with respect to operation and results from the investment in equipment. Knowing the need for this type system, the Keists were willing to take a chance in making major changes if it did not produce satisfactory results. So, for two years after the installation was completed they made complete and frequent checks on its performance which was found to be completely satisfactory.

The homeowner's satisfaction is evidenced by Keist's comment, "I might add that this job and the owner's enthusiasm has sold for us several other installations and more are expected."

Walter Keist, distributor for the Westinghouse electrostatic air cleaner in the Pittsburgh area, installs a new electronic tube in the power pack of the Precipitron in the home of Joseph Fingeret, Sewickley, Pa. This tube changes alternating current to direct current thereby making possible the operation of the Precipitron.



SECOND FLOOR PLAN

Correct Practice In Oil Heating

PART VIII — Installation of the fuel oil tank—Plans for single and double-tank jobs—Use of warning devices to stop overfilling.

By J. J. Mirabile
Vice President of Engineering—Harold E. Sweeney Corp., Philadelphia

FUEL oil tanks are made in various sizes and shapes. The most popular sizes are 22" and 26" tanks, commonly referred to as 275-gallon tanks. The tanks are made in 10, 12 and 14 gauge to meet local requirements. The dimensions of these tanks are 44" high x 22" wide x 72" long and 42" high x 26" wide x 66" in length. The 22" tank is used in narrow stairwells, doorways, etc., where the 26" tank is too wide for the existing building openings. The standard tanks have four top openings and one lower oil line opening. The tank used should have an Underwriters' label.

Reason for 275-Gal. Size

The reason the 275-gallon tank has become popular as an inside tank is due to the National Board of Fire Underwriters' regulation which sets 275 gallons of fuel oil as the maximum amount of oil which can be connected to the burner from an inside tank. However, if two tanks are installed, the regulations permit the use of two 275-gallon tanks having a storage capacity of 550 gallons, but, a three-way oil valve must be used to control the flow of oil from the tanks. (Fig. 1). The three-way valve will permit oil to flow only from one tank at any time. The other tank is automatically valved off. However, when oil gets low in the tank supplying the oil burner, the three-way valve is turned to draw oil from the full tank. The turning of the valve performs the following function: It closes the oil port from the tank low on oil and opens the port to the full tank. It is impossible to draw oil from both tanks simultaneously. This complies with the N.B.F.U. regulations because only one 275-gallon fuel oil storage tank is connected to the oil burner. The other tank is valved out of the oil line to the oil burner.

We previously mentioned that it is permissable to use two 275-gallon tanks where the NBFU regulations are incorporated in the local codes. It is important that the fill and vent pipes be connected with the vent pipe yoked high above the fill pipe yoke as shown in (Fig. 1).

This is necessary because when oil is delivered one tank may be ⅛ full and the other tank ½ or ¾ full etc. Therefore one tank will fill first, the oil will then flow to the other tank through the fill pipe yoke. If the vent yoke is low the oil will flow into the vent yoke and the air pressure in the partially empty tank will blow the oil out the vent pipe. If the vent yoke is high as shown the oil cannot flow into the vent pipe and either tank is free to vent regardless of which tank fills up first.

Standard One Tank Installation

The oil tank should be located near an outside wall to insure a short fill pipe. The tank man must not ignore this suggestion. A long fill pipe may mean trouble with every load of oil delivered.

The oil tank should have at least six-inch long nipples and deck flanges to support it off the floor. The flanges give the tank a neat appearance and also will prevent the tank legs from settling through any thin concrete floor. The weight of a full 275-gallon oil tank is more than a ton. If the cellar is not cemented, set the tank flanges on bricks which have been leveled in the dirt floor. Do not use wood, etc., to level a tank. If any leveling is required, use slate or screw the tank legs in or out to level the tank.

The tank can pitch either away from the opening or toward the opening. In many cellars, it is not always possible to have the tank exactly level. Therefore, make the best of this situation. The oil line tapping is 1" or more above the bottom of the tank. This is sufficient to permit sediment to collect, using clean oil. It will take many years before any tank sediment will give you any trouble.

The fill and vent pipe must be 2' away from any building opening on the same or lower level. This is a NBFU regulation. See the local authorities and get their requirements before proceeding with any installation. However, they usually follow the regulations in Pamphlet No. 31 issued by the National Board of Fire Underwriters, 85 John Street, New York 7, New York.

Size of Fill and Vent Pipes

The fill pipe size should not be less than 1½" and should be as short as practical, and it must pitch from the fill cap down toward the tank. This will permit the oil to flow by gravity to the tank. ¼" to the foot should be the minimum pitch.

The vent pipe must be 1¼" pipe. This is the mini-

mum size for 275-gallon tanks required by the NBFU regulations. The vent pipe must also pitch down from the vent cap to the tank. The vent line must never be installed without the proper minimum pitch of ¼" to the foot. If the vent line is trapped (low at one point) it will collect oil when the tank is overfilled. The oil will remain in this "trapped" position of the vent until the next oil delivery. When oil is again delivered, the pressure built up in the tank will cause the oil to flow from the trapped section of the vent out the vent cap. This may splash on shrubbery, masonry, etc.

Many fuel oil companies prefer a vent alarm on all their installations. This assists in preventing spills, etc. This device is a whistle actuated by the air being forced into the vent pipe by the incoming oil. The whistle blows until the opening in the vent alarm tube is covered by the rising oil in the tank. This causes the air to by-pass the whistle. This is the signal to the oil truck driver to stop the flow of oil into the oil tank. The whistle tube can be cut to permit a certain safety zone in the tank above the tube. Many fuel oil delivery men specify a 15-gallon safety zone. That is, after the whistle stops blowing the tank could receive 15 more gallons of oil.

The vent cap should be equipped with a screen to prevent insects from entering the vent pipe. The vent should be high enough to prevent snow from covering the vent cap.

The fill cap should be equipped with a good, watertight fill cap. It may be just a plain-pipe plug or a key-type fill cap with leather washer to insure a watertight point.

Combination fill and vent boxes are available which are neat and very practical. They permit a short vent and also overcome the problem of hiding the vent pipe. In some homes the vent pipe has to be run a long distance to the rear of the house or a chimney wall to hide it. However, the combination fill and vent box is very practical and less expensive than a long vent line. (See Fig. 2).

The tank gauge gives the approximate height of the oil in the tank. It is not as accurate as some people imagine it might be. That is, ¼ of a tank indicates on the gauge means that in a 44" tank there is approximately 11" of oil in the tank. This does not mean ¼ of 275 gallons. The shape of the tank precludes this assumption.

Never try to turn the float arm and gear-type gauge when the tank is filled. This will result in a bent float arm. Follow the gauge manufacturer's instructions. Most gauges can be taken apart easily, the tank flange is screwed to the tank opening, the gauge's float mechanism is then inserted, the arm is located so that it will have an opportunity to work without striking the tank. This position is usually parallel to the length of the tank. Never install the gauge float under the fill pipe. Install the gauge float under the vent pipe or under the extra tank opening. This will prevent the

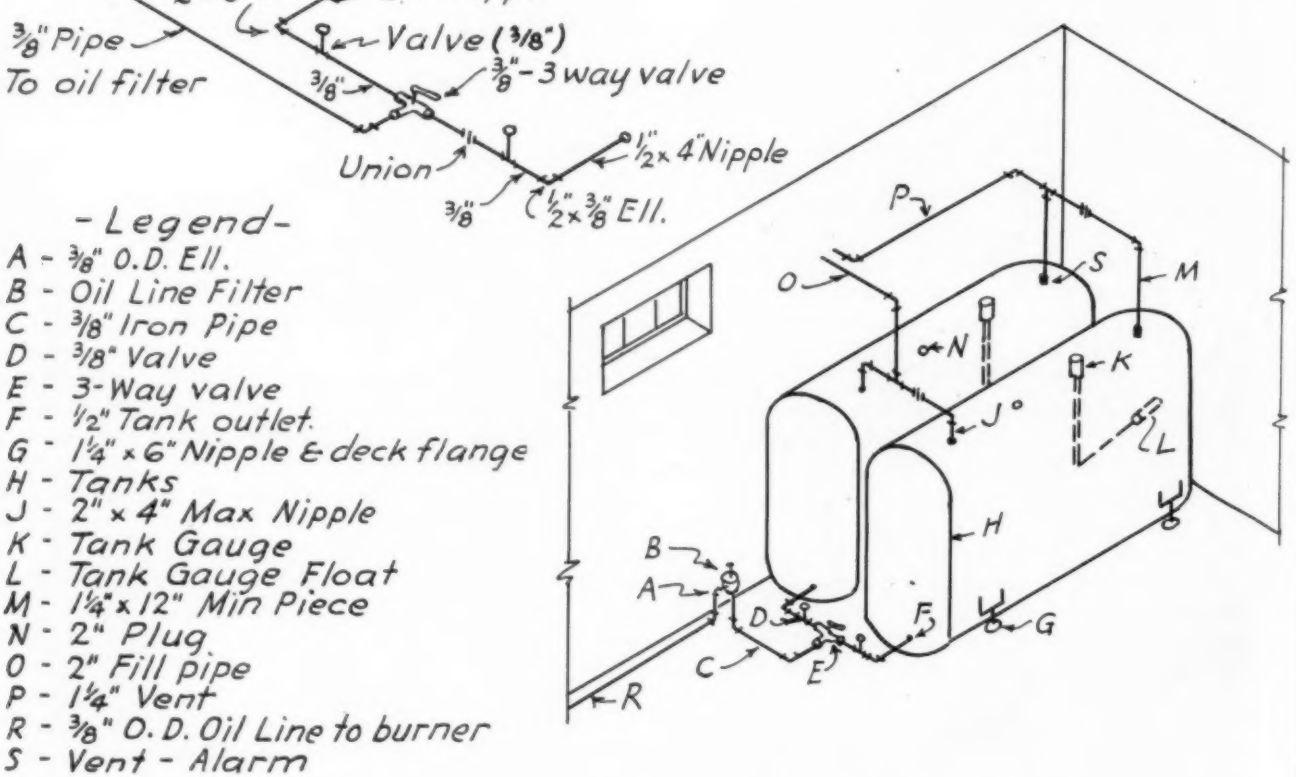


Fig. 1 Typical Basement 2-275 Gallon Tank Installation.

float from bobbing up and down when the tank is being filled.

Use of Tank Openings

Three of the tank's four openings are used for the fill, vent and tank gauge, the fourth opening is plugged. This is used to pump out the tank if it should be necessary and also to "stick" the tank if you wish to check the approximate height of oil in the tank against the reading shown on the tank gauge. The fourth opening may also be used for the oil return line if one is necessary. Use a good oil line valve, preferably one with a seat that is suitable for fuel oil use. An anti-hum valve is very practical. It can be used to prevent tank hums, as a check valve and as a shut-off valve. There are

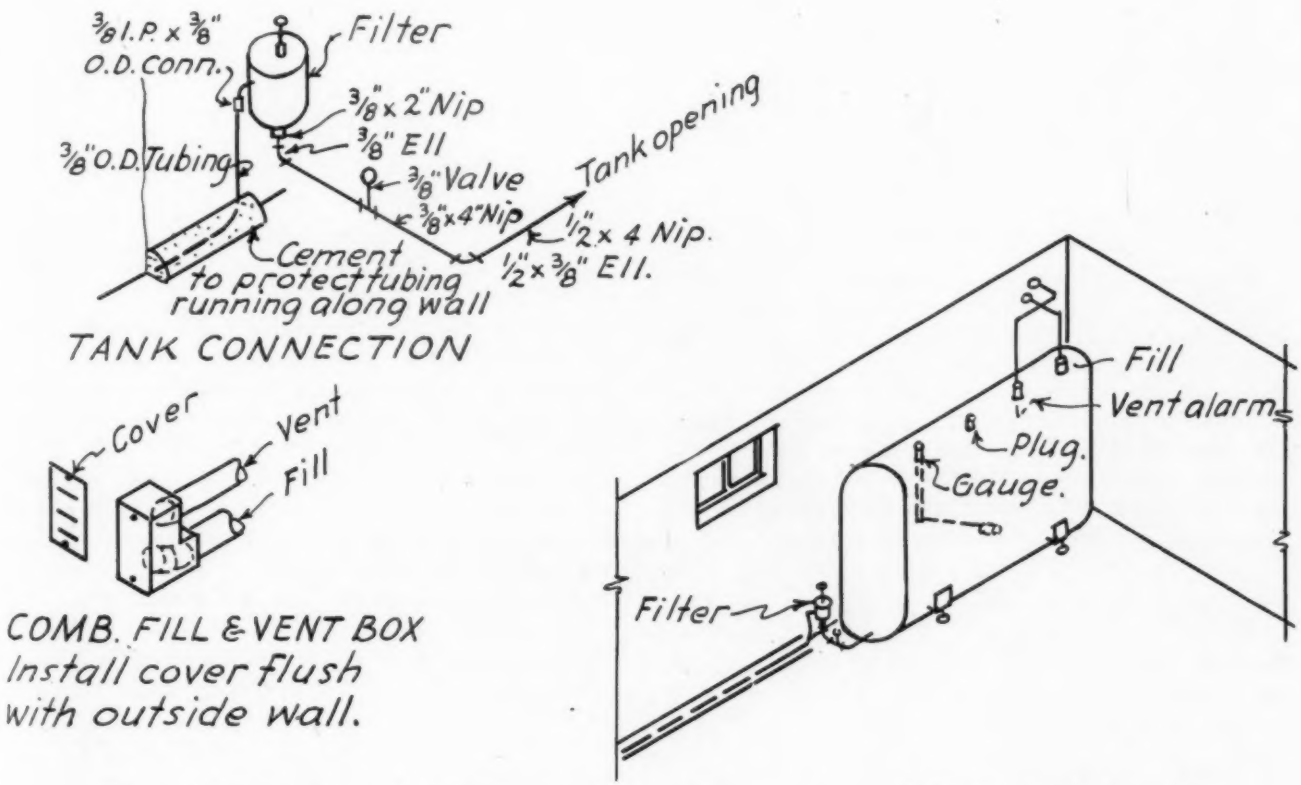


Fig. 2 Typical 275 Gallon Basement Oil Storage Tank Installation.

also valves on the market that have a fusible link or solder around a spring loaded valve stem. These valves are inexpensive and render excellent service in case of fire near the tank, they automatically close the flow of oil from the tank. However experience has proven that a tank of oil in a basement fire is safer than a ton of coal under the same conditions.

Use good black steel nipples and malleable iron fittings. Cast iron fittings can be used if available. Do not use bushings in oil line connections at the tank. Use a nipple and then a reducing ell. This eliminates a possibility of a leak at the bottom tank opening. Either compression or flare type oil line fittings may be used. If your mechanics cannot make good flare connections, then use compression fittings.

The filter should be large enough so that it may last one full season. It should be installed so that it is easily accessible for renewing the filter cartridge.

The oil line that has been popular for many years is 3/8" O.D. and has a .049 wall thickness. This is called 1/4" tubing by the plumbers because it's inside diameter is 1/4". Do not use galvanized pipe for the oil line. The action of some oils on the galvanizing will lift it from the inside surface of the piping and it will be a source of service calls. Copper eliminates many threaded joints; it is easy to lay and eliminates much labor required in threading pipe.

The oil line to the burner may be run along the cellar wall from the tank to the furnace. The line is then dropped into a trench about 1" wide and 1½" deep, from the wall to the oil burner. This trench is later cemented over. The oil line along the wall is also covered with cement. A trench may be cut from the tank to the oil burner. Do not place a strain on the burner pump when cementing the oil line to the burner. Keep the oil line away from the furnace to prevent the possibility of noise from the pump traveling to the furnace casing, etc.

Tank Protection

Paint the tank with a good, oil impervious paint. Do not use cheaper paints which become wet and run

(*Continued on Page* 182)

Minimum Specifications for the Installation Of Gas-Fired Heating Equipment (Part I)

These specifications are prepared by the Rochester Gas & Electric Corporation and are intended as a guide to certain features and practices which will insure the customer the best possible heating with maximum safety and with a minimum of operating cost and trouble. It is intended that in respects not specifically mentioned, the codes and practices of the National Warm Air Heating and Air Conditioning Association and the American Society of Heating and Ventilating Engineers will be followed. These specifications are intended as a minimum standard and are not to be interpreted as a complete guide to the selection and installation of gas-fired heating equipment.

Additional Standards for Forced Air Systems

Sizing the Unit

After the hourly heat loss of the building has been determined by an approved method, refer to the following table which provides a convenient method for selecting the proper size winter air conditioning unit for a specific heat loss. It should be noted that in addition to stating the proper size heating unit from the determined heat loss, the **minimum blower capacities and maximum volume of the heated space are also shown, these being considered minimum requirements for acceptable heating.**

BTU. Heat Loss of Building/Hr.	InputCapacity of Heating Unit	Air Delivery of Blower CFM	Max. Allowable Volume of Htd. Space
40,000	60,000	600	8,000
60,000	90,000	900	12,000
80,000	120,000	1,200	16,000
100,000	150,000	1,500	20,000
120,000	180,000	1,800	24,000
140,000	210,000	2,100	28,000

Concrete Base for Unit

If there is evidence of or a possibility of water in the basement or if the floor at the unit location is not perfectly level, a level concrete base of at least 2" thickness should be provided. Although this feature is not always necessary, it is always desirable.

Vent Pipe

The use of dampers or blast gates in vent pipe or chimney on gas designed units is prohibited.

Distribution System

Return air must be conducted to the furnace through ducts or pipes—air should never be returned through open registers nor should unexcavated areas be used as return air plenums.

If a two speed fan is incorporated as a part of the unit, an extended plenum type duct design should be used.

Garages should not be heated from the same heating plant used to heat the living quarters.

Floor type or baseboard registers are preferred over those mounted in walls above baseboards or in a high sidewall location.

Recreation rooms in basements should be provided with an adequate cold air return installed close to the floor and it is preferable to locate heat registers in the wall at the floor. Avoid, if possible, registers in ceilings or high in the sidewall.

All branch pipes must have accessible lock type dampers and shall be plainly marked indicating room being supplied. Crescent type with wing nut lock are preferred.

Warm air plenums shall be the full size of the furnace outlet.

Canvas connections should be provided between ducts and units for both cold and warm air. The canvas should not be pulled tight or painted.

CONVERSION BURNER STANDARDS

Cleaning and Preparation

Boiler and furnace walls and inside passages must be thoroughly cleaned of all rust, scale, soot and other dirt, using wire brush or other effective method. Leaking or cracked drums or sections on warm air furnaces must be replaced or adequately repaired. Furnaces must be reset, if necessary.

Remove the smoke pipe and inspect the chimney for broken tiles and other faults and, if necessary, clean the chimney.

Grates and other parts removed for the installation of a conversion burner shall be put aside in a suitable location specified by the customer.

Scrape all rust and scale from edges of fire-, clinker- and clean-out-doors and door jambs and file to a tight fit. This is important to obtain good combustion.

Down-Draft Units

Avoid the installation of gas conversion burners in down-draft furnaces or boilers where the products of combustion leave the furnace or boiler below the grate level. In case of question, consult the Gas Heating Service Department of the Rochester Gas & Electric.

Installation

Install the burner as directed by the manufacturer. In case of conflict with these specifications, these specifications are to be followed:

Burners shall be installed so that the burner port is at approximately the grate level. Avoid installing burner too high in the fire pot.

Seal all doors except the fire door with furnace cement. Similarly, seal all other openings, such as screw holes, etc.

The opening between the burner casing and the ash pit door frame must be adequately bricked or otherwise permanently sealed so that the air for combustion can be controlled through the burner casing. The use of asbestos paper tape is not considered to be adequate.

Where a fan unit is installed in conjunction with a conversion burner, the gas compartment must be sealed tightly from fan air.

Where the fire door ledge is ample, stand several bricks on ledge to screen the fire door from the burner heat. Enough space may be left between bricks to observe the burner flame characteristics.

For appearance, doors and base of heater and gas pipe should be painted. Do not paint any part of the conversion unit.

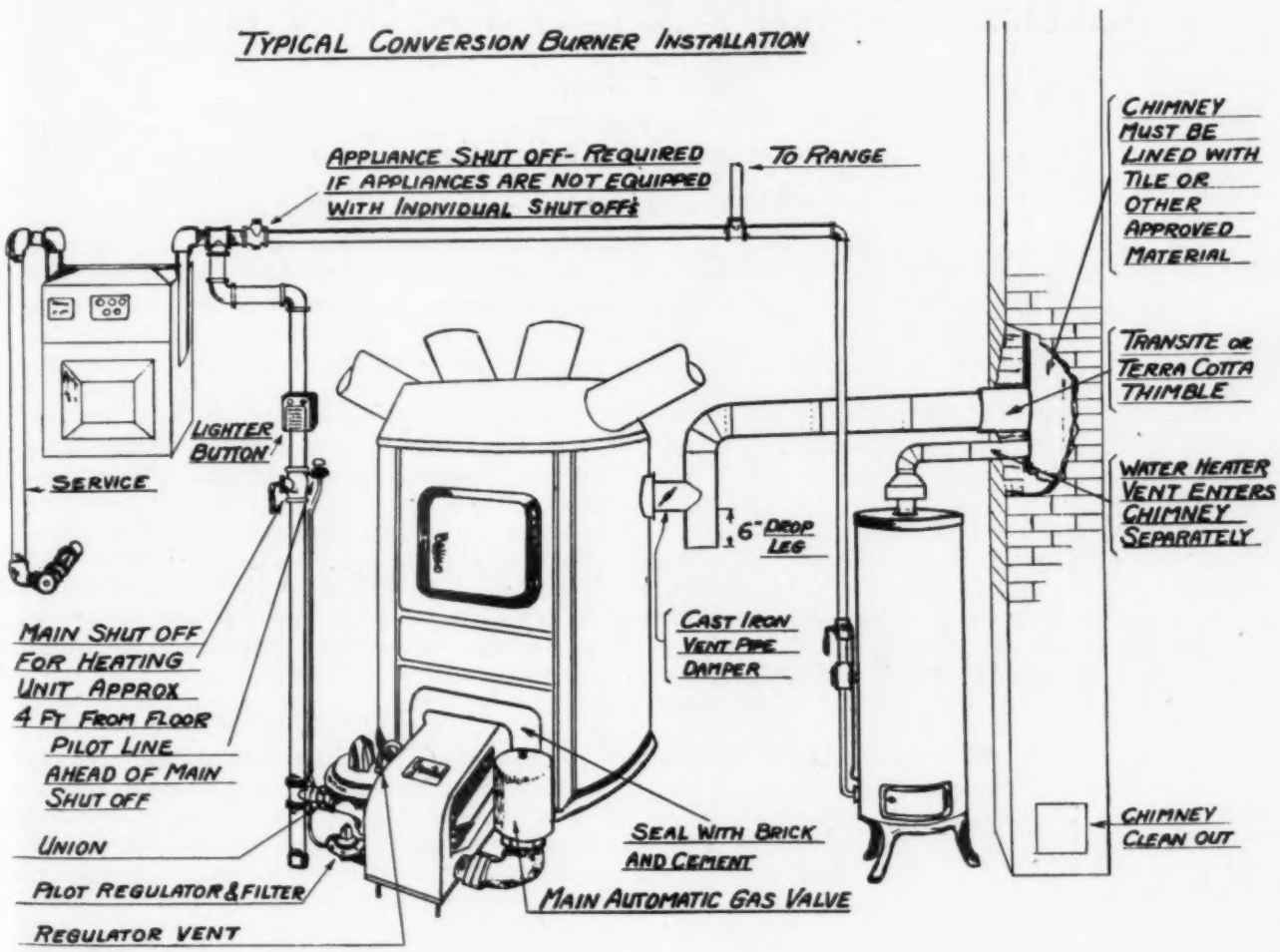
Thermostat wire should be stretched neatly along the gas pipe riser and taped to it at about 12" intervals.

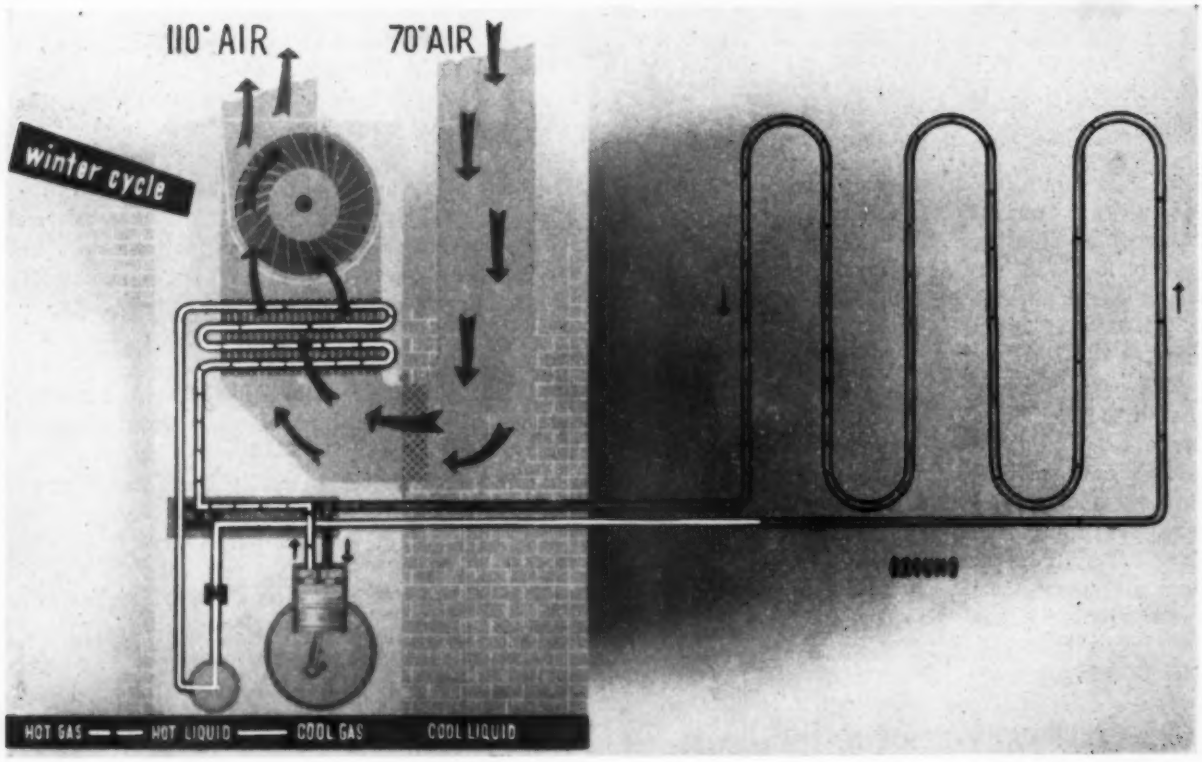
Provide a switch in either the line voltage circuit to the transformer or in the low voltage line from the transformer to the burner valve.

Sizing the Vent Pipe on Conversion Installation

The following tables show vent pipe sizes to be used for over-all length of 10 feet or less. Size vent pipe carefully—use smallest possible size:

(*Continued on Page* 184)


TYPICAL CONVERSION BURNER INSTALLATION
APPLIANCE SHUT OFF- REQUIRED IF APPLIANCES ARE NOT EQUIPPED WITH INDIVIDUAL SHUT OFFS
TO RANGE
CHIMNEY MUST BE LINED WITH TILE OR OTHER APPROVED MATERIAL
TRANSITE OR TERRA COTTA THIMBLE
WATER HEATER VENT ENTERS CHIMNEY SEPARATELY
LIGHTER BUTTON
SERVICE
6" DROP LEG
CAST IRON VENT PIPE DAMPER
MAIN SHUT OFF FOR HEATING UNIT APPROX 4 FT FROM FLOOR
PILOT LINE AHEAD OF MAIN SHUT OFF
UNION
PILOT REGULATOR & FILTER
REGULATOR VENT
SEAL WITH BRICK AND CEMENT
MAIN AUTOMATIC GAS VALVE
CHIMNEY CLEAN OUT



Case History of a Heat Pump

By A. C. Crandall
Vice President
Indianapolis Power & Light Co.

This article gives the test results of an actual installation of a heat pump or reverse-cycle refrigeration unit which operated in an Indianapolis home. High on the list of "post-war wonders" the heat pump has aroused a great deal of curiosity and interest in the field of heating and much of the interest seems to be justified.

NO OTHER domestic appliance, at a comparable stage in its development, has stirred such a volume of public interest as the heat pump. This is understandable because it represents a truly revolutionary means of complete air conditioning in the home.

Perhaps the most interesting and constructive contribution that we can make to the subject is to show the results of two years' successful operation of a heat pump in our city with which we have been very closely connected.

Early in 1945 Mr. R. C. Webber, supervisor of the Appliance Service Department of our company, approached Mr. H. T. Pritchard, our president, with a brand new idea in connection with heat-pump operation. His idea was to take heat directly from the ground by burying copper tubing through which a refrigerant is circulated. This appeared sound, and Mr. Webber was so sure of its success and so enthusiastic about it that he proposed to design, construct and install a pump in his residence and stake his family's comfort on its successful operation. Mr. Pritchard had for a long time been keenly interested in the heat pump both as a load building appliance and as a means of providing a new and superior service to the home, so a basis of cooperation was agreed upon and work started.

Speech delivered at Edison Electric Institute Sales Conference, Chicago, April 1-2-3, 1947.

Original Installation

To accomplish the greatest operating economy, the condenser coils were placed in a 125 gallon steel water tank. From this tank the water was circulated under pressure through individual radiators installed in the existing warm air registers in the floor. At each register a separate fan was mounted horizontally under the radiator for forced air circulation. This job operated well and with good efficiency for the balance of the heating season; however, it was evident, after short

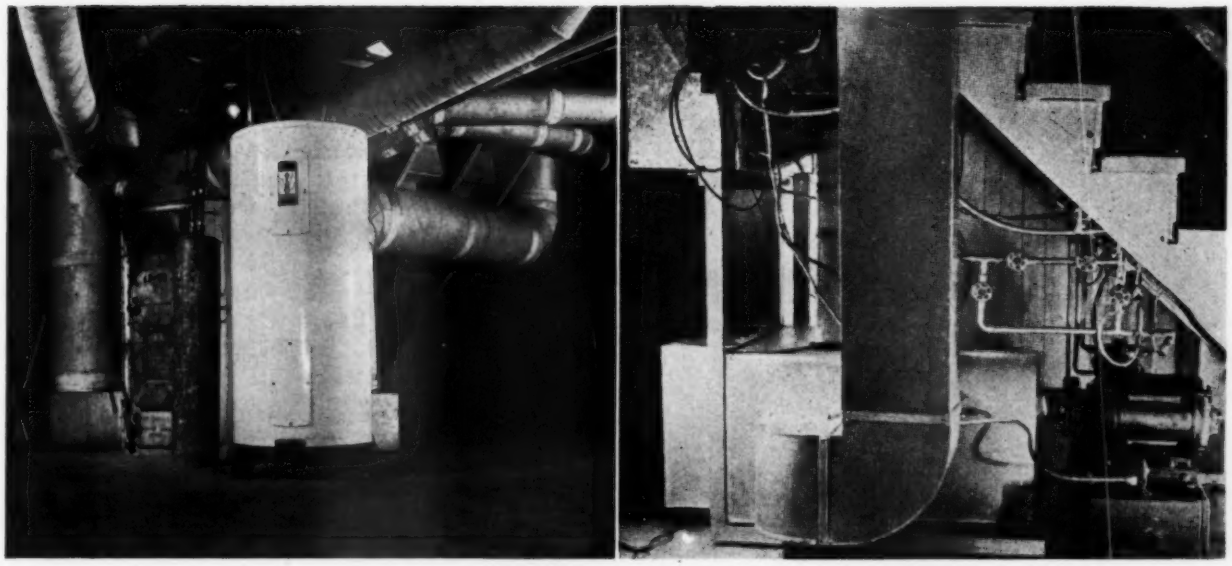


Fig. 1. This is actually one of those notorious "before-after" pictures since the picture on the left shows the Webber basement before the installation of the heat pump and at the right is a view of that heat pump.

operating experience, that no water storage was necessary and that adequate heat could be taken from the ground and delivered directly through warm air ducts to the heated space. This direct method would reduce heat transfer losses, eliminate the water circulating pump and, by making it possible to circulate greater air volume, maintain a more even temperature throughout the house.

In the summer of 1945 the water system was removed and the present earth-to-air unit installed. This unit has operated continuously through the heating season of 1945-46 and thus far through the heating season of 1946-47 without any changes except pressure adjustments and increase in the volume of air circulated. Satisfactory change-over valves were not available last summer so the unit has not been operated on the cooling cycle except for short periods when it could be operated manually. The short test seems to indicate that it will perform just as satisfactorily on the cooling cycle as it has during the heating seasons.

Considerable information in connection with the operation of this unit has been published; however even though it may be repetition to some, we would like to present the highlights of the unit's performance.

Heat Load Data

The area of the house is 31 feet by 28 feet, with five rooms downstairs and one upstairs. The first floor has about 7,000 cubic feet, while the basement has approximately 6,000. The heat load, using ASHVE constants, is 38,193 Btu. per hour for a design range —10 to +70 F. The house is equipped with storm windows and doors and two-inch zonolite insulation roof and sides.

The installed heat pump (Fig. 1) has a 3 hp. motor and compressor assembly mounted on a base outside the fan housing. The vertical pipe shown in the foreground is a duct from the cold air outlet on the first floor. The boxes, on the left side of the picture (top and bottom), house the condenser units.

In Fig. 2, the front view of the unit shows the vertical duct directly opposite the one shown in Fig. 1, which comes from the cold air outlet on the first floor into the bottom condenser housing. At the time this equipment was installed, Mr. Webber found it impossible to get the proper size condenser, so was forced to use two small ones. The rectangular ducts on the ceiling carry warm air from the condenser to the various rooms on the first floor.

Fig. 2. A front view of the heat pump showing the condenser housings and the warm air supply ducts.

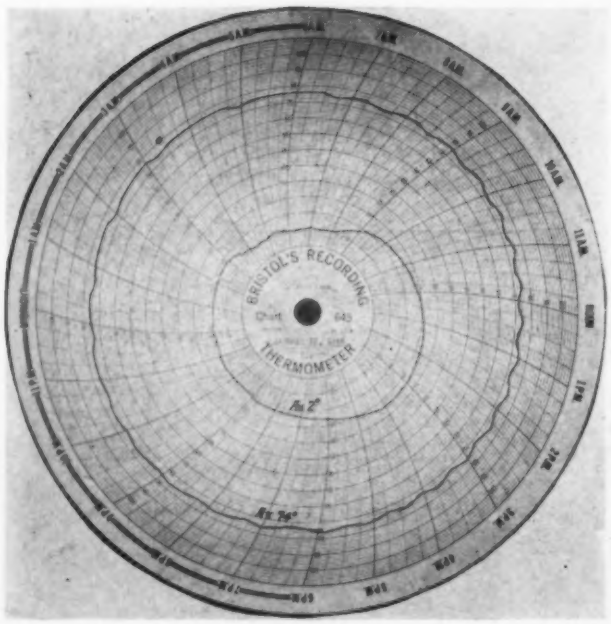


Fig. 3. Outdoor-Indoor temperature chart.

Fig. 3 is a temperature chart takenin Mr. Webber's living room on the coldest day of the 1945-46 heating season, January 22, 1946. Note that the outside temperature was as low as 10 F. for some time, although the temperature inside remained within two degrees of the 74 F. thermostat setting. This is really a comfort story and, from the standpoint of inside temperature, is typical of the daily charts taken throughout the heating season.

The temperature of air entering and leaving the condenser while compressor and fan are operating is shown in Fig. 4. The chart was connected in such a way that it operated only when the compressor was running. The outside line shows the temperature of the air entering the first floor rooms at an average of 110 F., while the air returning to the pump averages 69 F. Velometer measurements, at both the cold and warm air ducts, indicated that there was 46,200 cubic feet of air circulated per hour, which is equivalent to 6.7 changes per hour during the time that the unit is in operation.

TABLE I

Heat Pump Results for October 1, 1945, *to May* 31, 1946

Average outside temperature, degrees.	42.7
Average inside temperature, degrees..	74.0
Total degree days	7,620
Total compressor kwhr.	6,013
Total fan kwhr.	344
Total kwhr. use	6,357
Kwhr. per degree day.....	.835
Compressor running time, hours.....	1,630.68
Btu. to first floor.....	49,592,000
Btu. to basement	28,896,000
Total Btu. to home.....	78,488,000
Total Btu. electric input.....	21,714,000
Coefficient of performance.....	3.61
If compressor kwhr. only is considered, coefficient of performance is.....	3.82

Table I is a summary of the heat pump operation in Mr. Webber's home between October 1, 1945, and May 31, 1946. The average outside temperature was 42.7 F. while the inside was maintained at an average of 74 F. The 7,600 degree days was calculated from the actual inside and outside temperatures day by day. As a result they are greater than those published by the Weather Bureau, which was based on 65 F. inside temperature. The total kwhr. consumed by the pump for the season was 6,357, made up of 6,013 for compressor operation and 344 for fan operation.

Calculating the Btu. input into the house by means of temperature recording equipment and velometer measurements, and estimating the heat loss of the basement (ASHVE formula) showed 78,488,000 Btu. put into the house during the heating season with a consumption of 6,357 kwhr. These kwhr. times 3,412 Btu. per kwhr., would furnish 21,714,000 Btu. Dividing this figure into the total heat units delivered, we find the heat input 3.61 times as much as the combined electric input to the compressor and fan motor.

Cooling Estimate

The unit was not operated during the summer of 1946, except for a few short periods, because we were not able to secure the necessary changeover valves in time to get a season's operation. We estimate the cooling season would require approximately 720 hours' use of the compressor, plus about 1,260 hours' additional use of the circulating fan. This would mean a consumption of 1,692 kwhr., which at 2 cents per kwhr. (the rate at which this unit is being served) would make summer cooling energy cost approximately $34. Adding this to the heating season's consumption makes a year around energy cost of approximtaely $160 or $14.25 per month.

TABLE II

Heat Pump Results for October 1, 1945, *to May* 31, 1946, *Compared with Results for October* 1, 1946, *to March* 10, 1947

	Season of 1945-46	Season of 1946-47 to March 10
Average outside temperature, deg....	42.7	39
Average inside temperature, deg....	74	74
Total degree days (74 deg. base)...	7,620	5,649
Total kwhr. used (comp. and fan)...	6,357	4,530
Kwhr. per degree day.....	.835	.802
Coefficient of performance.....	3.61	3.77

Table II is a comparison of the performance of the heat pump for the heating season of 1945-46 with the season of 1946-47 up to March 10, 1947.

TABLE III

Comparison of Estimated Heat Loss With Actual for Season October 1, 1945, *to May* 31, 1946

Total kwhr. used	6,357
Total degree days	7,620
Estimated Btu. heat loss at 11,472 Btu. per degree day	87,400,000
Actual heat input to home.....	78,488,000
Btu. input from other electrical use in home at 6 kwhr. per day.....	5,000,000
Total actual heat input to home.....	83,488,000
Excess of estimate over heat input, Btu.	3,912,000

Per cent excess of estimate over heat input 4.69

Table III shows a comparison of the estimated heat loss and the actual heat input for the season. Note that the estimated Btu. heat loss for the house, based on ASHVE method of calculating, is 11,472 Btu. per degree day, or a total for the season of 87,400,000. The actual heat input to the house, calculated as previously explained, is 78,488,000. In addition it is calculated the heat from refrigerator, electric range, deep-freeze unit, lights and general electric service approximated six kwhr. per day or a total of 5,000,000 Btu. for the season. Adding this to the heat input shows a total of 83,488,000 or 4.69 per cent less than the calculated heat loss of the house on a degree day basis.

TABLE IV

Monthly Record of Heat Pump

	Av. outside temperature	Av. inside temperature	Degree days	Total kwhr. used	Kwhr. per degree day	Coefficient of performance	Total M Btu. input to home	Btu. per deg. day input
Oct. '45	51.4	73.0	671	418	.62	4.05	5,790	8,620
Nov. '45	42.0	73.0	935	815	.87	3.91	10,999	11,750
Dec. '45	23.7	73.0	1525	1459	.96	3.67	18,272	12,000
Jan. '46	28.2	73.8	1415	1435	1.01	3.43	16,852	11,900
Feb. '46	32.0	74.0	1179	1132	.96	3.36	12,983	11,000
Mar. '46	51.0	75.3	758	527	.70	3.68	6,626	8,730
Apr. '46	53.1	75.2	662	406	.61	3.49	4,814	7,280
May '46	59.1	74.4	475	165	.35	3.80	2,152	4,530
Av. or total	42.7	74.0	7620	6357	.835	3.61	78,488	10,300

Table IV is the monthly record of the pump's operation. You will notice that there is a variation of kwhr. per degree-day with the varying outdoor temperature during the heating season, which, of course, makes a difference in the coefficient of performance in a range from 3.36 to 3.91. This may be due, in part, to the difference in Btu. per degree-day input as shown in the last column on the right.

TABLE V

Monthly Load Factor

	Run time	Load factor, per cent
October '45	138.00	18.5
November '45	268.50	37.3
December '45	373.30	50.2
January '46	343.07	46.1
February '46	253.46	37.6
March '46	119.42	16.1
April '46	94.20	13.1
May '46	40.73	5.5
Total	1630.68	28.0

Table V shows the running time and load factor during the heating season—in other words, the per cent of running time to the entire lapsed time, since the load remained the same at all times. Note that December shows the highest load factor for any one month of 50.2 per cent. I might add further that during the coldest day of the winter, when the temperature was —10 F. for about five hours, and the average for the entire day was +2 F., the running time of the pump was 15.6 hours out of the 24. Load factor will, of course, vary with the size of the unit in comparison

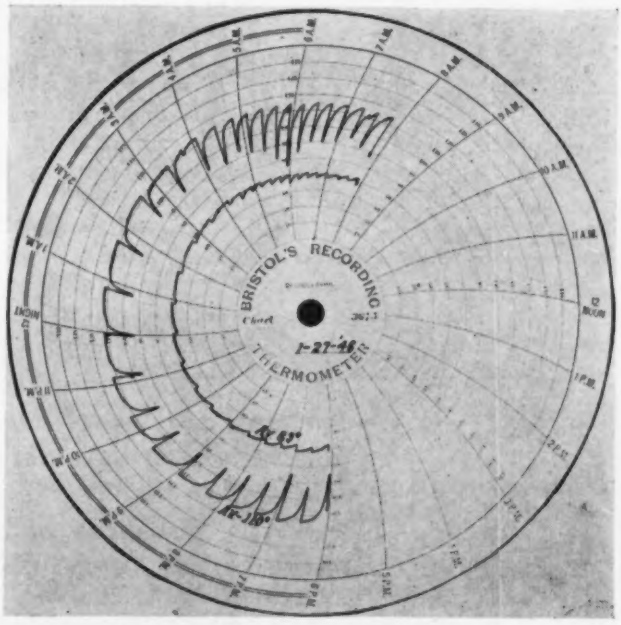


Fig. 4. Condenser air temperatures.

with the maximum heat loss of the house and outdoor temperature conditions.

Adding the calculated kwhr consumption for the cooling season, and the operating time of both the compressor and the circulating fan, we estimate that the summer consumption would be 1,692 kwhr which, added to the operation during the heating season, would result in a load factor of 23.6 per cent.

TABLE VI

Coil Radiation Capacity

#1—4'6" deep.....	Primary	19.64 sq ft
#2—3' deep.....	(Primary	19.64 sq ft
	(Secondary	10.8 sq ft
4' deep.....	(Primary	19.64 sq ft
	(Secondary	10.8 sq ft
#3—5' deep	(Primary	19.64 sq ft
	(Secondary	10.8 sq ft
6' deep.....	(Primary	19.64 sq ft
	(Secondary	10.8 sq ft
#4—5' deep.....	Primary	19.64 sq ft
6' deep.....	Primary	21.2 sq ft
	Total	182.24 sq ft

Maximum capacity air circulated first floor 46200 cu ft per hour.

Maximum capacity temperature rise 118 F –69 F = 49 F

Maximum Btu = 46200 x 49 = 41200 Btu per hour

$$\frac{41200}{182.24} = 226 \text{ Btu per sq ft coil per hour}$$

55

If primary radiation only is used

Btu per sq ft = 296 Btu per sq ft per hour.

Table VI is a summary of the installed earth coils. There is a total of approximately 700 ft in 100 ft lengths of ¾ inch copper tubing through which the F

(*Continued on Page* 186)

Finger-Tip Climate Control

By R. C. Nason

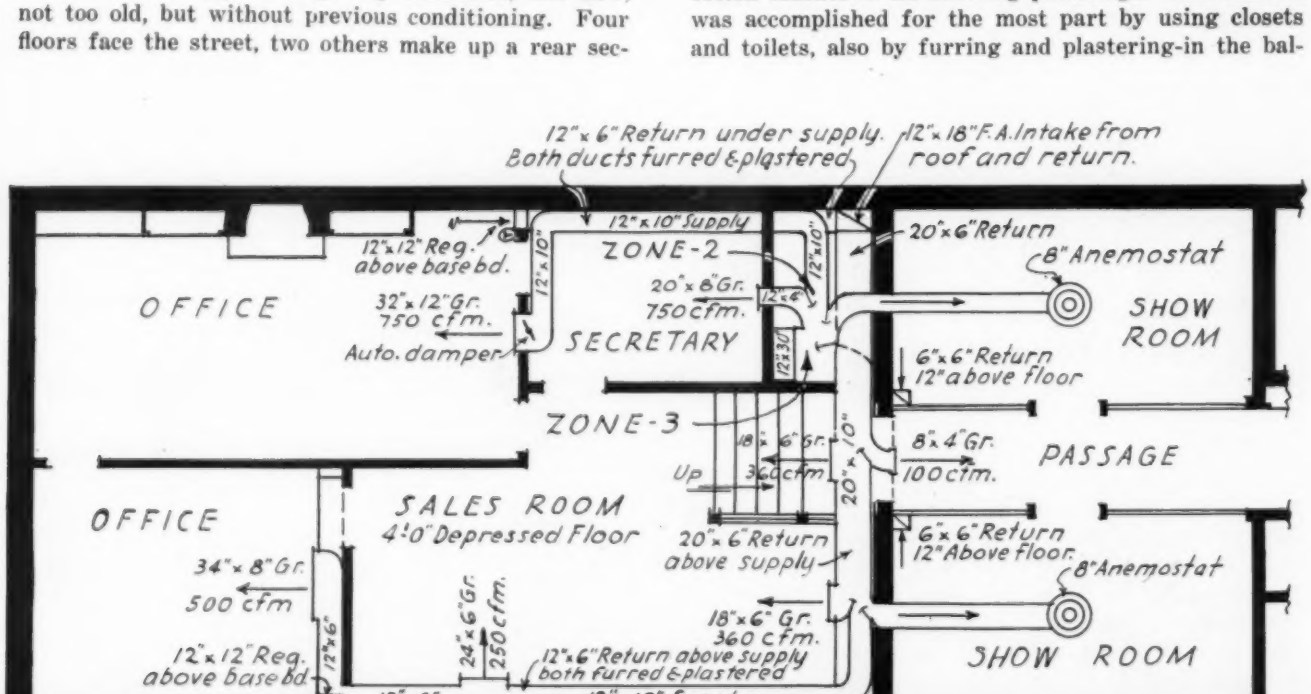
A story about a year-round air conditioning installation is always of interest and particularly so when the job is of the magnitude of the one described below. Encompassing seventeen rooms on three floors this installation required seven zones for the maximum in flexibility of temperature control

THERE are several features of interest in the renovation of a four-story New York City building at 16 East 41st Street here, in the heart of the shopping district, in that unusual air conditioning problems were encountered. These were solved in a practical way by Architect Charles Burton and the contractor, The Schwerin Air Conditioning Co. Apparatus control, designed for the personal comfort of occupants, fosters the concept of "finger-tip" mechanical operation of the seven zones into which the system is divided.

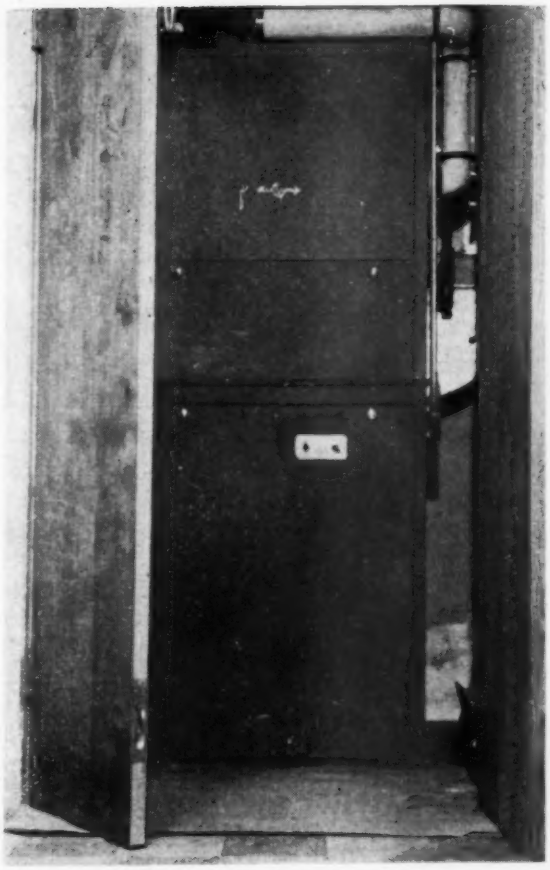
Type of Structure

Here was a typical large-city structure, not new, not too old, but without previous conditioning. Four floors face the street, two others make up a rear section. Since the air conditioning concerns only the front section, it can be said that the first, mezzanine and second floors only are included in the contract. The load required four modern fan units that provide heating, cooling, humidification, filtering and distribution of supply and return air.

The building's structural features proved vexatious in laying out the new conditioning plant. There was the problem, for example, of introducing supply and return ducts in existing rooms not previously so planned, as well as the problem of duct concealment in rooms intended for display and sale of high grade cotton textiles to an exacting patronage. Concealment was accomplished for the most part by using closets and toilets, also by furring and plastering-in the bal-



PLAN



Placement of the units in closets, as above, was made necessary by the absence of a furnace room for that purpose.

ance of the ducts along room ceilings. The ultimate appearance is not unpleasant.

Cooling Load

In estimating the size and type of conditioning units load factors were not considered severe though the gross load required three 5-ton units and one 3-ton unit. On the street side, especially on the first floor, glass surface is considerable, covering practically the entire front wall. On the second floor, which is a single large, long room, but with one small office adjacent to it, there had to be considered the heat generated by seven full-width fluorescent, suspended, light clusters in a room 20 ft. wide by 75 ft. long. This called for a 5-ton conditioning unit.

Another problem was placement of the units when there was no machine room. Two 5-ton units were placed in the basement, one to handle the front of the first floor, the other the rear of this floor. The mezzanine floor (between the first and second) called for a 3-ton unit, which was well concealed centrally in a made-closet with duplex doors. A 5-ton second-floor unit similarly was placed in a closet at the rear.

In order to understand this work better it should be stated that there are 17 rooms altogether that are conditioned in the new system. Frontage of the building is 25 ft., full depth 100 ft. But only the first floor is full depth, the other floors are 75 ft. deep, for a flat roof covers the first floor at the rear. Most rooms were provided with supply and exhaust grilles, the supplies high, the return low, typical of cooling work.

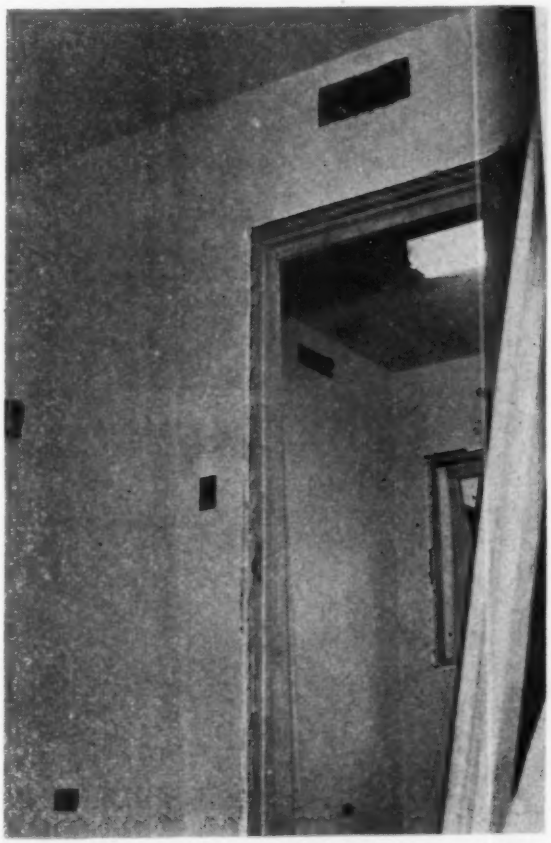
Arrangement of Zones

As related, there are seven zones for the supply. All zones have wall thermostats, placed 5 ft. above the floor. Five zones also have humidistats, placed near the thermostats. Zones also have at least one louvered grille and louver power damper motor for manipulation except the second floor and one on first floor zone, which omit the damper motor and louvers. Power damper motors are belted to duct sides and fully concealed within the duct furring area. Access doors were placed nearby for service.

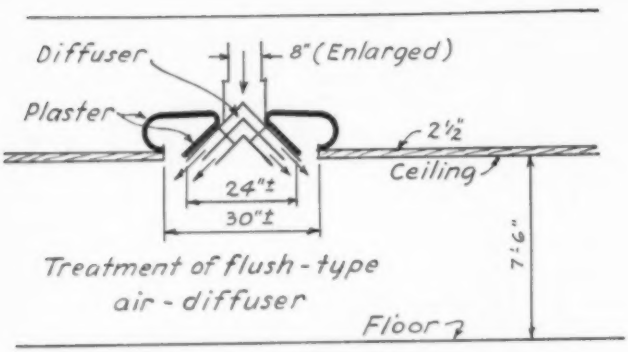
Tracing the zones, there are three separate zones on the first floor; one for the front, the others handling individual rear offices. The first of these zones covers a well-decorated reception and display room just off the entrance.

An almost duplicate arrangement covers the mezzanine floor, that is, one zone for the front, two others for rear executive offices. The second floor has its own zone. It will be used for display and selling purposes. Setting control for all instruments is according to the tastes of individuals occupying the space.

The humidistats in this arrangement are for winter use, for water shed off refrigeration coils in units handles the humidity problem ably in summer. The conditioning units have internal mist nozzles to humidify. When the wall instruments have been satisfied, automatic control shuts off the water supply to the cabinet nozzles. Solenoid electric power valves control the heat supply, the solenoid being placed on ½-in. steam supply lines near units. All units also have sectional filters.



Air distribution system utilizes high sidewall and ceiling diffusers to prevent cool or warm air striking occupants of the rooms.



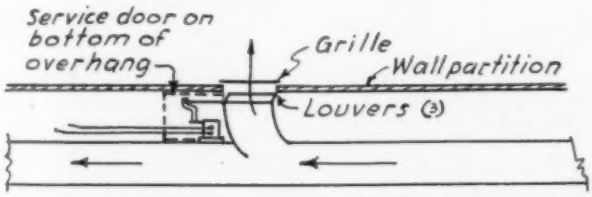
Room Elevation

No combustion occurs within the units because steam is furnished by the District Steam Co., whose network of underground piping covers the city. So the Airtemp units have only to cool, humidify, filter, heat and distribute the air by enclosed fans. Fin-tube radiation in the cabinets takes care of the heat supply, twin fans in units circulate it.

Seventy-five per cent of the air supply is recirculated, the balance is fresh, outdoor air taken in through two rear grilles. Toilet and interior staircase exhaust is at present by gravity, it being anticipated that the slight outward pressure within the building will help the exhaust at these points. All supply ducts were insulated with 1-in. aircell, wired on.

Treatment of Diffusers

Another interesting feature that bears the mark of novelty is the architectural treatment for two 8-in. Anemostat ceiling diffusers in two small offices on the first floor. The ceilings here are but 7 ft. 6 in., so it was desired to bring the base of the diffusers flush with the ceiling. The architect effected this by having his mason concave the area around the distributor and carry the plaster downward to the lowest cone of the distributors of 8-in. neck size. (See sketch.) The net result is a sort of mushroom appearance that while pleasing to the eye does not interfere with the functioning of the distributors.



Plan View of Typical Arrangement of Automatic Dampers in 7-Zone Cooling System.

Another architectural feature, as related to air conditioning, is the 4-ft. depression of the rear section of the first floor without ceiling-line change. This converted this section from a medium to a high ceiling space and improves appearance, considered valuable because one room is to be a reception room for two executive offices housing officers of the company. The addition to the cooling load is held to be slight.

Inasmuch as the building recovers 75 per cent of its air by recirculation, thus placing most rooms under pressure, it is held that the slight breeze that greets visitors at the entrance has some advantage, at least psychologically, in hot weather. The owners are Gampe Corp., the ducts were manufactured by Charles Hartmann Co., Brooklyn, N. Y., in combination with conditioning engineer-contractor, The Schwerin Co.

Have You a Picture Like This?

IN October American Artisan will adopt a new style of front cover that will feature the "Picture of the Month" in fields served by this publication.

Our particular need is for pictures of warm air heating and residential air conditioning installations that will serve to publicize the quality of work being done by our industry. Such photos will bring the reader $5.00 on acceptance.

Judgment will be on a basis of content, clarity, composition and general interest to our readers. For reproduction purposes 8 x 10 glossy prints are preferred and photos not used will be returned.

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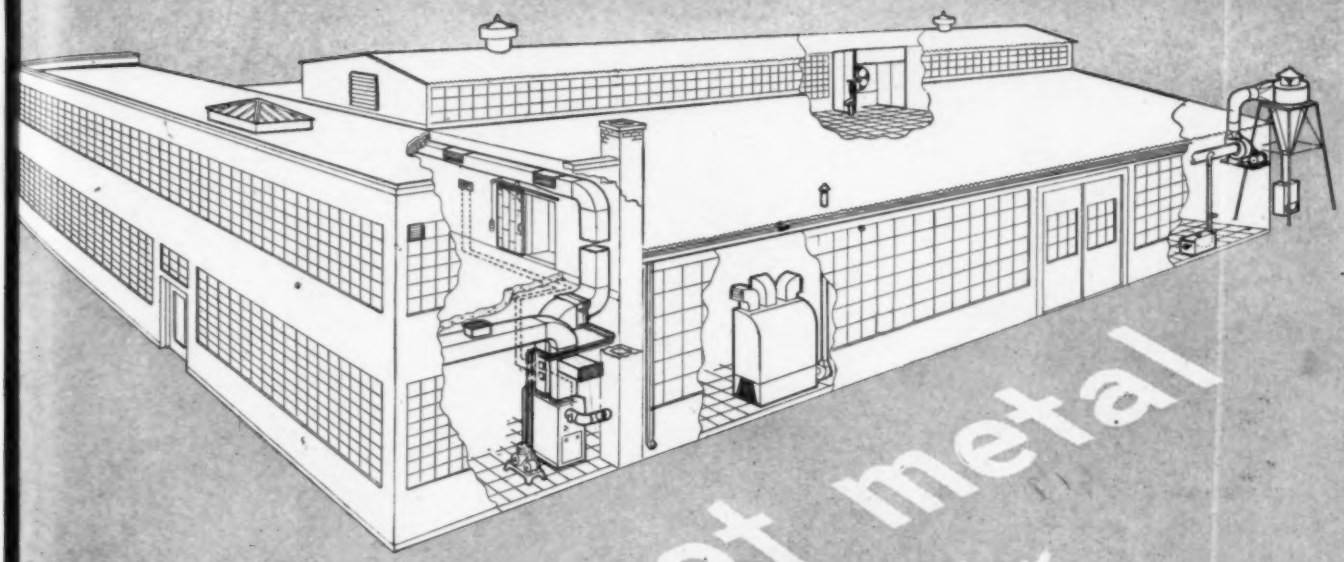

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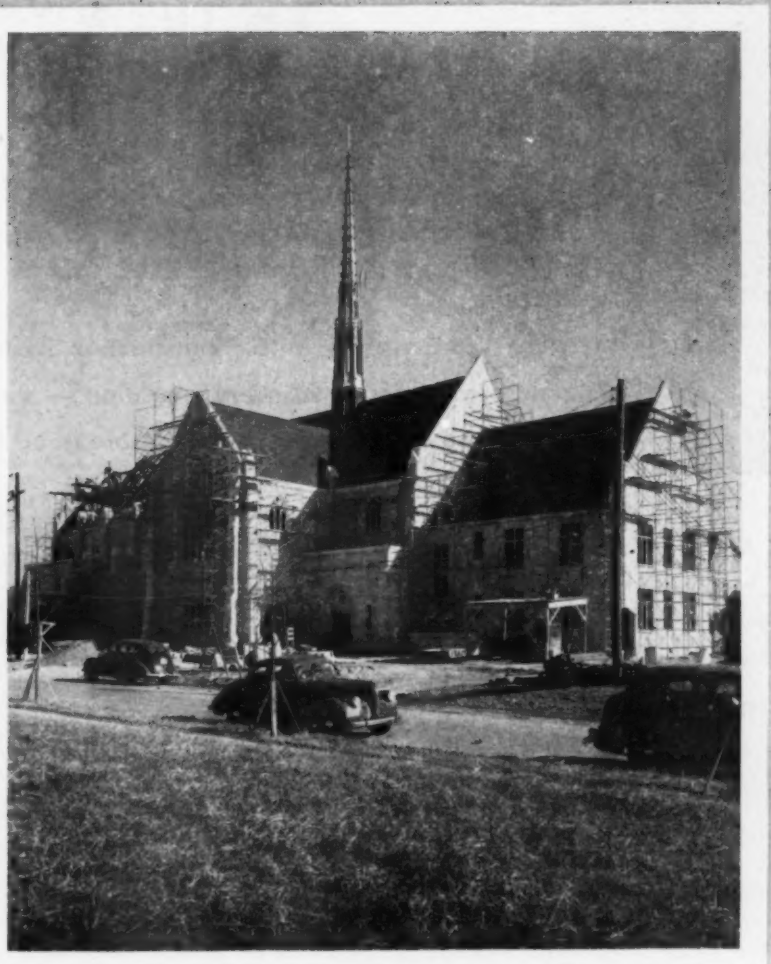

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Finish Treatment of Welds

Many contractors make special efforts to turn out jobs of welding that will meet all strength requirements for the purpose intended and then are careless about the appearance of the finished job. The importance of proper treatment is the message of this article.

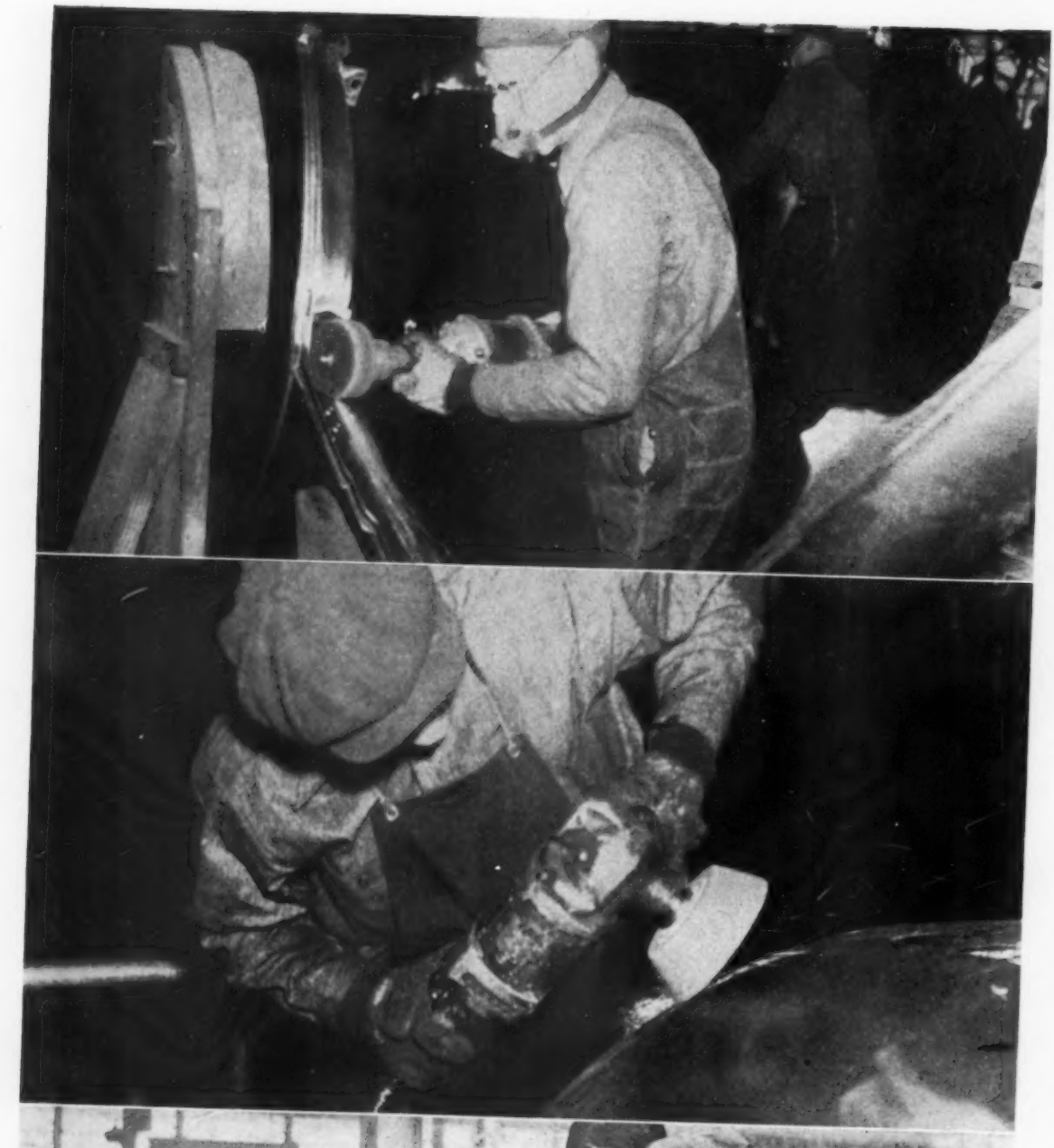
OBSERVATION of "finished" output of several sheet metal contracting and processing plants reemphasizes the virtue of providing well-tailored work as a logical highway to more profit. This is because unblemished physical appearance has definite extra value that can increase selling cost. One way of effecting the desired result is the careful reduction of weld beads so that no unsightly globs of metal, flux or scale are left behind.

Though rough beads may have little or no connection with the strength of the welded joint, their presence discounts the value of the fabrication in the eyes of the customer as a rule, thus making him more hesitant about paying fair prices than is true when the work has been carefully tailored.

Finish of Steel Neglected

Because steel is one of the easiest sheet metals to weld, usually less care is taken by way of finish than is true of the more dressy sheet metals like aluminum and stainless steel. Aside from the matter of smoothing off weld beads with air chipping and scaling hammers it is too often felt that there is no special point about being fussy with ordinary steel work. This attitude is allowable, let's say, when an article like a 16-gage hood is to be used on a blacksmith's forge. But if the hood were to be installed over a cooking range or steam table in a high-grade kitchen, good finish is a worthy objective.

Most readers recall cases of abnormally high, uneven beads seen on sheet metal work referred to as "finished." Some contractors do not bother to reduce beads because there exists the idea that abnormally high beads provide extra strength. Often, however, the reverse is true because it is likely the bead became too high due to the weld materials depositing on top of the joint instead of penetrating the cracks between edges or other parts to be joined.



Penetration thus may be only partial. Some vital areas of the joints actually may not be amalgamated. Thus the high bead may be an indicator of a weak rather than a strong connection.

Some contractors air-chip the surplus globs as a "coverup." This is allowable when there is sufficient strength left for the anticipated duty of the work. But sheet metal artisans are not prone to "coverups" as a rule. It is more likely that weld chipping and grinding are done to enhance appearance, a logical and sound-business objective.

Air Tools are Valuable

Light types of air chipping hammers and scalers suitable for most sheet metal work are found in the tool rooms of many shops. In using them, though, there is a tendency to dress too finely with them, particularly when painting is to follow. Perfect preliminary bead reduction by chip-hammer may prevent adhesion of the paint, because though the bead has been reduced flush, adjacent metal parts remain untouched. For painting it is suggested that reduction by chip-hammer be not too fine. Complete the dressing by grinding wheel, in which operation a generous adjacent area also should be roughened but not deeply.

Most contractors do not chip or scale stainless steel or aluminum, but grind it. If only one dressing operation is to be used, a coarse or medium-grit wheel serves. But if the work is to be polished as well as the general custom is use of a medium-grit wheel first, then a fine-grit wheel afterwards. For joints so carefully finished that they are not discernible, one has to both polish and buff, and it is surprising how thoroughly the job can be done by experts. Good workmen can conceal welded joints in white metal so carefully that one has to look on the inward sides of the fabrication to see where the joints were made.

Special points of attention in ordinary steel work are tack welds. These frequently are seen a trifle bunchy, rougher and higher than the rest of the completed seams. So the suggestion is to reduce the high tack spots to at least the level and contour of the rest of the joint.

One sees in nearby columns several cases of air-chipping hammer use, from which one notes that weld bead reduction is by no means their only function. They are used for trimming off surplus metal like fins, burrs, selvage, as well as bead dressing.

Types of Grinding Wheels to Use

Use of grinding wheels alone for weld-tailoring also is common, particularly in plants that lack compressed air for chipping. Solid grinding wheels as a rule are appropriate for all ordinary classes of sheet metal work, though aluminum welds most often are peened smooth. Attention is paid to exterior, exposed parts of fabricated work, rarely to interior surfaces that do not show in the service applications.

For first cuts, rubber and bakelite-bonded wheels are recommended. The rougher the surface and the heavier the bead, the coarser the grit to be used. Lard oil on the work, while slowing grinding somewhat, has the virtue of preventing loading of wheels with metal particles that are hard to clean out for future use. A vital point here is that in grinding stainless steel and aluminum, the wheels must be clean, for if one uses wheels loaded with refuse from other metals as, say, ordinary steel, there is danger of corrosion formation on the completed work.

The more refined the work and the softer the sheet metal in process the finer the grinding wheel grit is good advice. Information also points out that when the ultimate in unblemished finish is desired, wheel grits should be medium at the start but fine for final stages of the process. If a single operation is required, a wheel of about 16 to 20 grit is the thing. But for stainless steel and other work to be polished use 20 to 24 grit, with rubber-bonded wheels preferred.

Vertical grinders, or flaring and straight-cup types, are appropriate for flat surfaces, with maximum tip speed of 9,500 f.m. At this high speed one has to use organic bonds it is found. Rubber and shellac-bonded wheels, suggested, allow high production rate at the indicated wheel tip speed. For getting into corners such, for example, as stainless steel sink basins, cone pattern grit heads are effective. Due to their blunted pineapple form, one can reach most all corners and crevices. From the hundreds of currently catalogued grinder heads available one can select a proper shape to reach any ordinary spot in sheet metal work.

In handling aluminum work, a general suggestion is not too much grinding and less chipping and scaling. Use the peening hammer instead. Remove flux deposits by brushing them with scalding water or immersion in equally hot baths. If they resist such plain efforts, dunk the work in a dilute hot sulphuric or nitric acid bath followed by clean water rinsing.

• • •

Beating Material Shortages

THE situation arising from material shortages has been made worse recently by the frantic buying of substitute materials, many of which are now unobtainable and in many cases the hunt is now on for substitutes for substitutes. The bartering of scarce materials has become almost "standard operating procedure" throughout many industries and our own particular industry is no exception. Recently reports have been received indicating that some manufacturers are trading oil furnaces for motors and oil burners and other manufacturers are trading furnaces for galvanized iron and black plate.

This bartering of equipment for other equipment goes even beyond the manufacturers level with cases recently cited indicating that distributors and even contractors are exchanging certain items which they have in surplus for other items which are hard to get. For example, the bartering of furnaces for motors or oil burners has been current for some time at the contractor level. A case recently cited was that of a large automobile manufacturer who had many thousands of tons of galvanized iron which he did not expect to use but which he had gathered for the purpose of using as a bartering medium in exchange for items which the automobile manufacturer needed to complete his cars.

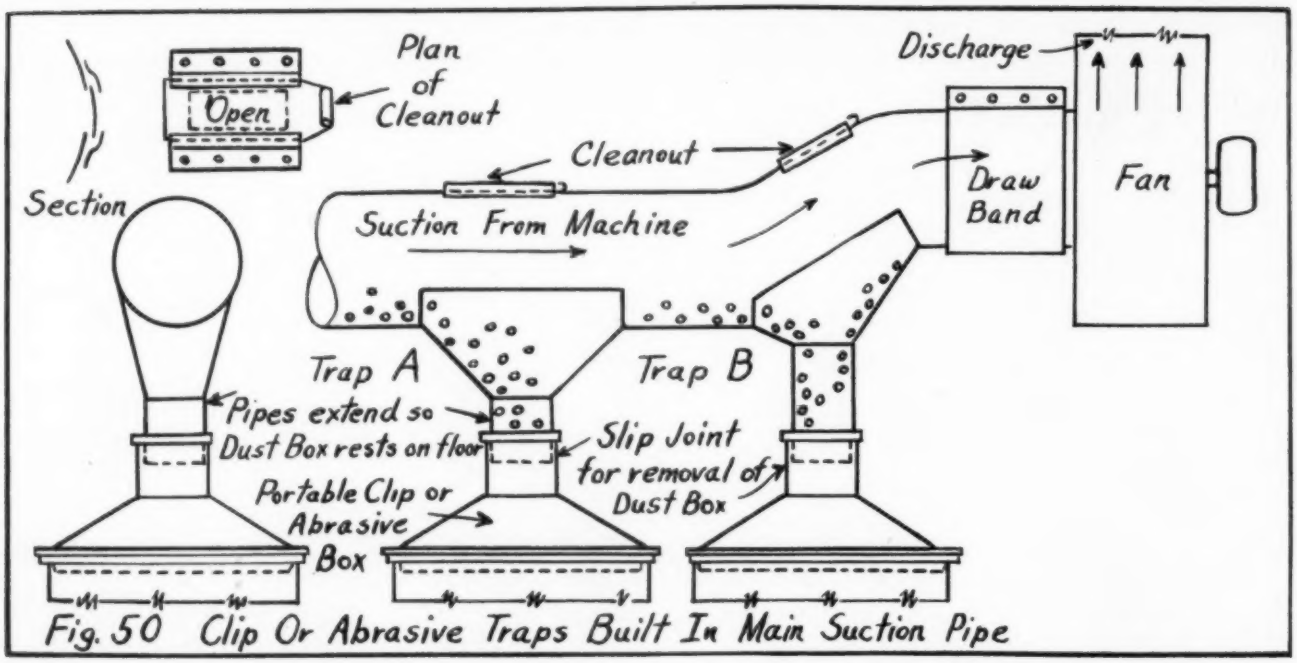


Fig. 50 Clip Or Abrasive Traps Built In Main Suction Pipe

Pattern Development for

Heavy Gauge Blow Pipe Fittings*

[Dust Collector Trap]

By William Neubecker

FIGURE 50 and the text covering same is a reproduction taken from page 539, Plate No. 25 in the book *Standard Practice in Sheet Metal Work* published by the National Association Sheet Metal Contractors. The following is part of the text covering Fig. 50. "Solids that drag along the bottom of a pipe are easily trapped as shown at *A*, Fig. 50, the finer dust being carried with the air blast. Solids that are held in suspension are trapped by a slight rise in the pipe as at *B* to change the direction of the air and cause the refuse to drop. Cleanouts are built over each trap. On difficult jobs it is desirable to use a 90 deg. elbow and build a trap as at *A* or *B* on the heel of elbow. In this way the centrifugal force at the heel of the elbow causes the solids to fly into the trap and settle out of the air blast. In stone cutters' plants chips often weigh several ounces and are easily handled but have great abrasive effect." Owing to the abrasive effect, these traps should be constructed of not less than No. 20-gauge galvanized sheet metal.

The method of developing the pattern for trap *A* is shown on the full page drawing. Similar method can be used if trap *B* is desired. In their proper relative positions draw the side and front elevations and their plan views. *B* in the side elevation shows the section of the suction pipe, also the side elevation of the trap, the front elevation of which is shown by *A*. As the four quarters of the trap are similar, it is necessary to make use of only one quarter of the plan shown below the side elevation in which one quarter circle has been divided in only three divisions to avoid a confusion of lines in so small a drawing. In practical work more divisions should be used. From the divisions *1*, *2* and *3* draw lines to the corner *D*, also a line from *3* to *4*. These lines represent the bases of triangles to be constructed whose altitude will be equal to the vertical height of the trap *D-E* in the side elevation, as shown in the diagram of *true* lengths at the lower left hand corner of the drawing. At right angles to *D-E* draw the line *E-H*, on which place the length of the lines in the quarter plan as shown by similar numbers in the *true* length diagram. From these points draw lines to the apex *D*. Then will *D-3* *D-1*, *D-2* and *D-4* represent the *true* lengths of similar numbers in plan.

Developing Pattern Shape

At the lower right hand corner of the drawing draw the center line *B-1*, at right angle to which, draw the

(*Continued on Page* 194)

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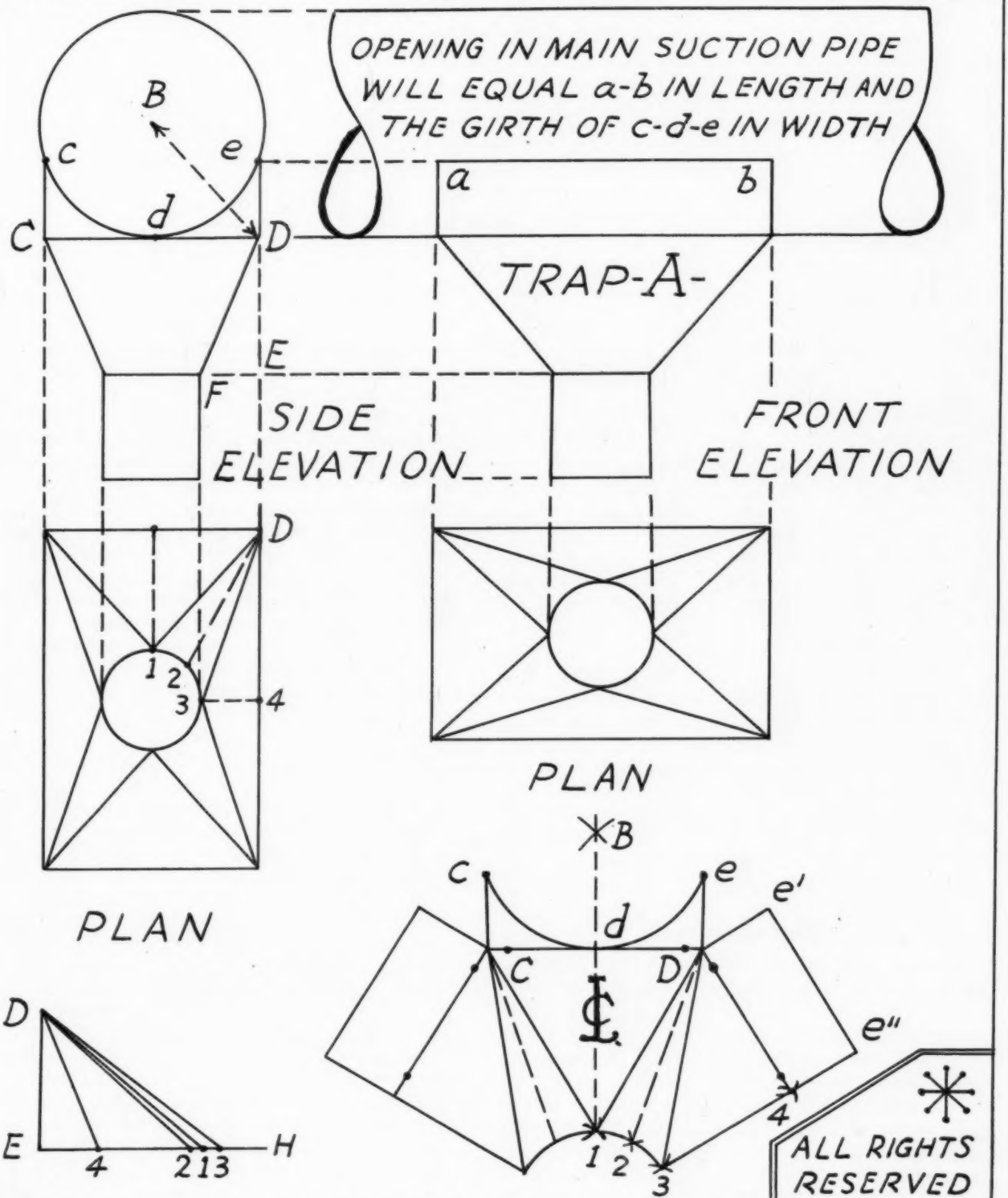
-PATTERN-FOR-TRAPPING-ABRASIVE-
XIV SOLIDS-IN-DUST-COLLECTORS *

CONSTRUCT OF Nº 20 GAUGE SHEET METAL



TRUE LENGTHS • ONE HALF NET PATTERN

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Design of Waste Removal Systems (Part I)

By H. M. Nichols
Industrial Dep't, Sturtevant Div.,
Westinghouse Electric Corp., Hyde Park, Mass.

These articles are adapted from a series of lectures that are presented in the Sales Engineering School of B. F. Sturtevant Co. Their application of basic principles is so sound as to be of value to any sheet metal contractor handling this type of work in any large quantity.

BEFORE going into the details of the various types of dust and fume control and pneumatic conveying systems, we will first discuss the calculation of the elements of these systems since the method of determining the air volume, system resistance and fan requirements is the same for all of these applications.

The elements of such a system consist of a fan to create the air flow, a piping system through which the air and material conveyed flows, and an entrance device through which air and material enter the piping system. In addition, there may be a separation device at the final discharge whose function is to separate the air from the material at the point of discharge. These separators are sometimes called collectors, due to the fact that they serve to collect the conveyed material at a central point.

Dust control and pneumatic conveying systems may be classified in various ways. They may be classified by the industries served, by the purpose to be accomplished, or by the type of system used.

Classifying these systems by the industries served, they fall in subdivisions such as metal working, woodworking, leather and shoe manufacturing, rubber industries, pottery works, pulverizing plants, plastic manufacturing, felt hatting, textile mills, grain and cereal industry, etc.

Types of Systems

However, from the design standpoint, these systems are best divided into two main groups as follows:

(1) Systems for removing wastes, dust, fumes, etc., from machines and processes.

(2) Systems for the transport of bulk materials from one location to some other location.

Under the first classification come such applications as exhaust from saws, planers, sanders, etc., in woodworking plants, systems for removing dust from grinding, buffing and polishing wheels, nappers and shear exhaust in textile mills; exhaust from grain elevators, sand blast rooms and similar applications; exhaust from mixing rolls in rubber mills.

Under the second classification come such applications as conveying cotton and wool in textile mills, conveying cut rags, shredded rubber tires, waste paper, sawdust, fish meal and similar materials in the various process industries.

Usually the distinguishing characteristic in these two classes of systems is the way and manner in which the material to be conveyed is introduced into the conveying or exhaust system.

In class I systems, the material is usually a waste or noxious product produced at various machines or processes and given off in such a manner that it is more or less difficult to confine the waste or noxious product within the machine or apparatus and prevent its discharge to the general atmosphere.

In class II systems the material is usually fed or delivered to the air conveyor system in a concentrated condition and there is not the problem of preventing the escape of this material outside the machine or process.

While the basic methods of computing the elements of class I and class II systems are the same, the approach to the problem is usually somewhat different for the two classes of systems.

In class I systems the problem is usually presented as one of maintaining a certain suction at the entrance to a number of hoods or of maintaining a given air velocity through one or more hoods or series of slots.

In class II conveying systems the problem is usually one of moving a certain volume of air at a given velocity which has been determined by the quantity and characteristics of the material to be conveyed.

The basic factors involved in the computation of these systems is the volume of air to be handled and the velocity to be maintained in the branch and main ducts. In certain special cases, such as exhaust from grinding wheels, instead of air volume and velocity, the specification calls for given size connections to exhaust hoods, together with a stated suction at these connections. These code type specifications, however, are readily reduced to a basis of air volume and velocity.

In the study of the fundamentals applying to the theory of air flow in fan applications one learns of the methods of determining pipe friction, entrance losses to hoods and other factors affecting flow of air in a pipe.

In working out simplified, rapid, and useful methods of solving practical problems in this field, we do not always follow the theoretical procedure, as in practice we never have ideal or exactly known conditions and consequently there is no advantage to be gained by refining the computations to a high degree.

Class I systems are governed in most states by State Industrial Codes which have the force of law. Most of the state codes are patterned after the New York Industrial Code or are similar to it. Even where there is no applicable state code, we usually follow the procedure of some of the accepted codes in design of this class of system.

In grinding wheels and similar applications the basis of the codes is the requirement that each wheel be provided with a hood having a suction connection of a size determined by the size of the wheel and that a stated suction be maintained at each hood connection.

As an illustration, the New York industrial code specifies wheels 10 to 16 inches in diameter and not over 2 inches thick shall have a minimum connection of 4 inch diameter, and wheels 20 to 24 inches in diameter and not over 4 inches thick shall have a minimum hood connection of 5 inch diameter. The code also states that a minimum of 2 inches of water suction shall be maintained at all hood connections.

Having laid out an exhaust system to the code specifications for hood connections and pipe sizes and determined on the suction to be maintained at the hood connections, the final step is to figure the air volume and the maintained resistance of the system and choose a fan which will deliver the required volume of air at the required pressure.

Volume of Air

The volume of air handled by an exhaust system is determined by the total effective connected load area and the suction at the hood connections. By load area we mean the area at the throat of the hood. The hoods cause a restriction of the air flow which varies with the construction of the hoods, per cent of open area and effect of the enclosed wheel. The restrictive effect will vary from hood to hood but field tests have shown that 70 per cent of the total gross load area is a good average for the net total effective load area of the usual exhaust system. The velocity of air flow over this area is determined by the formula:

$$V = 4000\sqrt{i}$$

Where V = air velocity in feet per minute, and i = suction at the hood connection in inches of water.

Cfm. handled by the system is equal to total net effective load area times air velocity or cfm. = .70 × A × V. Where A = gross load area in square feet and V = air velocity in feet per minute.

This method of figuring air volume assumes a uniform suction at all hoods. This would not be true on an extensive piping system, as with a given suction at the far end of the system and assuming uniform diameter and length of branches, suction at hoods nearer the fan would be increased by an amount equal to the friction drop in that portion of the main extending from the point in question to the far end of the main. It is also presupposed that the friction drops in the various branches are all the same, and if there are some large or small diameter branches, allowance must be made for these factors.

If the system is an extensive one and has been figured on the basis of uniform suction at all hoods, then after the installation is completed it must be balanced by checking the suction at the hoods with a gauge and reducing the suction at the connections near the fan to the proper figure by placing a restriction in their branch connections. This restriction can be a cone shaped piece of metal placed in the branch pipe near the junction to the hoods, the proper proportions to be determined by trial.

Problems of Hood Connections

If the system is an extensive one and is not to be balanced after installation, then it is necessary to compute the additional suction at the various hood connections and compute the volume of air at each hood based on the increased suction at each hood. The total volume of air handled by the fan, of course, being the sum of these individual volumes. Unless a system is badly unbalanced by long and uneven runs of small diameter pipe, a simplified procedure is to figure the air volume for the entire system on the assumption of a balanced system and uniform suction at all hoods and then add a percentage increase to this volume to cover the effect of unbalance. Experience in figuring the systems will give you an idea of how much to add to compensate for the unbalance. Unless the conditions are unusual, 10 per cent added to the computed air volume will be found satisfactory. However, care must be taken in the layout of the system and location of the fan so that great variations in pressure drops are avoided, as otherwise it will be necessary to balance the system. In case of doubt, make a rough check on the worst locations. To keep the system well balanced, locate the fan centrally and have any small diameter long branches near the fan with large diameter and short branches farthest from the fan. A small diameter very long branch pipe near the far end of the main header can badly upset the balance of the system and should be avoided.

Exhaust from open booths, canopy hoods, slots and similar applications are usually specified on the basis of a set velocity over a given area of opening or as so many cfm. per square foot of tank area. In applications of this type we usually assume effective orifice area as being 70 per cent of the gross area as we do in the case of grinding wheels.

With class II conveying systems, the air entrance is usually either through an open pipe end, feed hopper or similar device. Effective orifice area is assumed as 70 per cent of the gross area for the average condition. If the orifice is a smooth, well-rounded bell mouth, the coefficient may be as high as 98 per cent. A flat plate orifice may be as low as 60 per cent, while 70 per cent is a good average for an unobstructed open pipe end.

The Idea Exchange

Production ideas others have found useful. Your idea sare invited. Illustrations are particularly desired.

Automatic Welding Process

BETTER appearing work with a considerable saving in time accompany the use of the Heliarc welding process in the fabrication of Monel boxes in the plant of P. Feiner & Sons, New York City. This contractor has repeat orders involving about 150 such boxes, 9 in. by 9 in. by 12 in. high, per order and of 24-gage Monel.

Side and base forming from flat pattern, by oxweld stack-cutting method 20 sheets at a time, was handled on the press brake. As the work is ready for corner welding, there are four base joints each 9 in. long and one side joint 12 in. long. Shop cost due to rapid production desired caused Mark Feiner, president and chief engineer, to design a special welding jig. Its clamp was hinged at one end, the clamp hinge and a trunk lock occurring on the left of two vertical clamp-supports.

Elimination of the use of flux or other preparation persuaded the fabricator to install the argon-gas Heliarc machine and torch seen. Placing the welder on tracks, with the jig and its work correctly lined up, an operator places the torch at the top end of the Monel seam to be welded and presses a control button that starts the welder in motion. The joints thus flow together. No finishing operations are necessary.

Before installing the Heliarc process Feiner used to oxweld this work, the 9-in. joint requiring about 5 min. But with the Heliarc machine, jig and present method as explained, this 9-in. seam is formed in 1 min., thus resulting in an 80 per cent reduction in time plus still greater reduction in unit cost because of the absence of finishing operations previously employed.

—R. C. Nason.

Furnace Cleaner

THE picture below shows a warm air cleaning machine which we built to clean cold air returns and heat pipes, and the inside of furnace casing.

The procedure is as follows: We cover up each cold air return register and close each heat register. We cut an opening in the base of the furnace casing and install a slide to open and close same. Our machine is set up in the basement and we attach a five inch flexible tube to the casing.

We then clean registers and returns by using a powerful blower to blow the dust accumulations back down into the furnace casing where the machine exhausts the dust into the large bag (12 ft. long 5 ft. high). We blow one heat run or one cold air return at a time and when it is finished we close it up and go to the next one. The blower we use has a velocity of 28,000 lineal ft. per minute.

We formerly used a large truck cleaner and we were limited by the weather. This cleaner we carry in a ½ ton panel truck and the weather does not bother us, consequently we can clean the year round and get a lot of cleaning from gas heat warm air jobs, both gravity and forced air.

The machine is equipped with a ¾ HP motor and has a speed of about 3000 RFM on the exhaust fan.

—O. H. Lerum,
Eastman Furnace Co.,
Minneapolis.

Tools and Their Uses

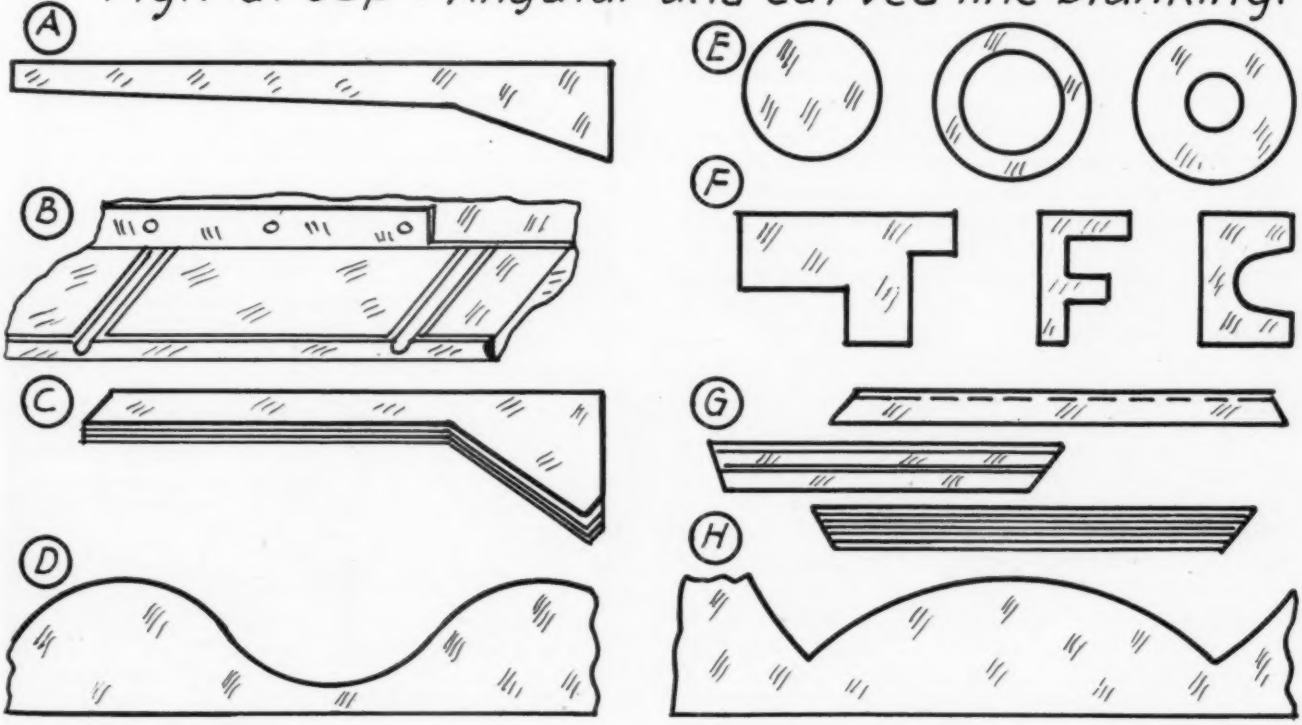
A series dealing with the various tools that are used in and adapted to sheet metal work. The articles will discuss common uses as well as unusual applications that may not be familiar to all.

By Ernest E. Zideck
Sheet Metal Consulting Engineer

Blank Preparation (II)

IN THE preceding article titled *Blank Preparation* we have shown and discussed blanking by hand-shears and the squaring shears, and now continue with showing hand and power operated machines and apparatus employed in blanking on irregular and curved lines, depicted in the sketches under Fig. 1, of the below group of drawings. At (A) we see a blank which is cut on the one long and the two short sides in the squaring shears, but the inner, angling portion of which would ordinarily be hand sheared or nibbled, or cut in a throatless or rotary shear or bandsawed. In the case of only a few blanks of that or similar nature being wanted, the operator of a foot squaring shear might mark the point of the straight line termination upon the metal pieces and then shear to the point in the foot-operated shear by lowering the blade slowly and carefully so that it meets the lower blade exactly at the point marked on the sheet. By turning the metal about he then can make the shorter-distance cut similarly. No such shearing can be done in the power-operated shear because the blades close one over the other their entire length. In certain instances of

Fig. 1 Group: Angular and curved line blanking.



hundreds of blanks of similar contour being in production frequently, *shorter* shear blades have been procured and employed, somewhat as shown at (B) in the sketches, though the blades are then mounted so that their first closing end starts the cut and the cut terminates at the other end of the shortened blades because here the blades do not close over each other as much as they do at their starting point. This shortened-blade cutting will result in the sheet bending somewhat under the pressure of the blade-less bar, but the metal will not tear in that bending. Lighter gauge metal will straighten out by itself, while a heavier gauge metal and extremely soft metals must be straightened out after.

Use of Rotary Shears

If we dispose of a rotary nibbler or a bandsaw adapted to cutting or sawing *staked* sheets, as indicated at (C) in the sketches, we would obviously do this blanking (not the one long and the three short sides which can be sheared in the squaring shear) in that manner, saving time. Single blanks may be sheared to the indicated edge contour in a throatless shear, lever or cog-wheel operated, or in a rotary shear or by the electrically operated hand-manipulated portable shears. Curvature shearing, as shown at (D), can be done best by the rotary discs of a rotary shear. Circle and ring shearing as of (E) in the sketches need not be enlarged upon because the machine has been used in practically every sheet metal shop and its operation in conjunction with the metal holding attachment is sufficiently known. Samples of blanking shown at (F) are indicative of blanking which, though it can be done by hand shears and any other shears, is nevertheless best accomplished (productively) if the sheets are staked and bandsawed. But if we have only a few of the blanks to contend with, any rotary shear will do the work, and if we do not mind the metal bending in the machine, we can use the throatless shear.

Intricate work of that nature can be accomplished in the rotary shear. At (G) we indicate angle, extrusion and tube cutting on desired degree angles, and although an adjustable hacksaw will do the work, or we may cut the pieces to angles, bandsawing them, the best tool for this work is a toothed disk or carborundum saw, stationary or hand operated. The stationary saw is preferable in that it has gages adjustable to the degree angle, while the hand operated saw depends on markings or on a contrivance as an adjunct to such sawing, providing the adjustable feature, commonly a vise-like rotary tool. The blank as of (H) can be nibbled or disc-sheared.

Specific Best Performances

The lever-operated throatless shear, although employable in straight line shearing of sheets down to 3/16 of an inch in thickness, is best used in curved or irregular line shearings, as shown in Fig. 2 of the drawings. This shear performs both as a straight shear and a *nibbler*, and if we have only a small quantity of the blanks in production, this tool will do admirable work in producing the irregular line shearing. Obviously, as in any shear, the blades must be kept sharp and mainly tightfitting, as has been pointed out in the previous article relating to hand and squaring shears. The operator need not be as experienced in doing the work on this shear as he is required to be if the machine is power-driven; he operates the lever by hand, pressing down upon it when he sees that the line marked upon the sheet on which to cut is aligned under the upper cutting blade. He guides the metal piece by his one hand while his other hand operates the lever, pressing down upon it, deeper on a straighter cut and almost imperceptibly if the cut curves sharply, in this latter case the cutting being gradual, one-eighth or one-quarter inch at a time, so that the sheet can be turned between the blades for the next coming step—cutting along the marked line. Identical shearings as of Fig. 2 may be performed *faster* in the rotary, hand-operated shears, although the gauges of metal worked in this machine (as commonly available in a standard sheet metal shop), will not exceed the 16 gauge. True, machines of this kind are produced for cutting heavier gauges, but ordinarily then power is employed, because hand operation interferes with guiding the metal accurately along the line. Greater power can be exerted by a lever than by rotary motion, while on the other hand the cutting discs can be easier aligned with the marking on the sheet, and a facile rear movement, returning the disk, makes for quicker adjustment of the metal being cut to the line on which to cut.

Operation Requires Skill

More familiarity with the machine and dexterity in its operation is required if we employ the circular shear for irregular line shearing, removing the attachment used for circles and rings shearings. The cutting discs here are of a smaller diameter and the driving wheels comparatively large, making for a facile movement of the former, taxing the operator's ability of guiding the sheet for cutting on the marked line. The advantage of this machine, provided with

Fig. 2 Portable nibbler and throatless shear work.

Fig. 3 Rotary shears blanking

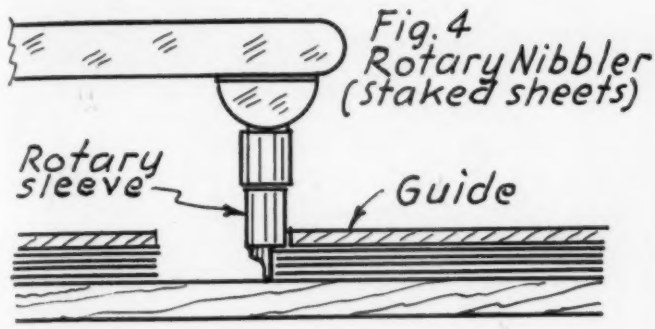
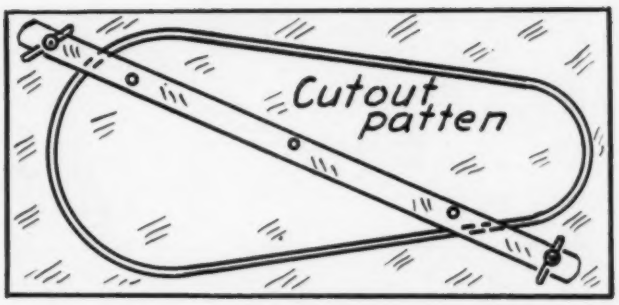


Fig. 4 Rotary Nibbler (Staked sheets)



the arm to which fastens the ring or circle cutting attachment, is the facility of using the arm for sheet support, fastening a wood top to two-by-fours fitting over the frame of the arm, providing a kind of bench or table for the sheet to repose on while being cut. This sheet support will greatly facilitate the operators handling the metal, guiding it between the discs by one hand while the other hand operates the handle moving the discs. Another advantage of the small cutting discs is the ease of turning the sheet sharply, effecting the most intricate curvatures, as shown in Fig. 3. It is not necessary that we discuss here the use of this machine in circle and ring shearings because these operations are well known to the men working in the sheet metal shop. Infinitely more ability is called for in the operator if this shear or the throatless shear are *power-driven*. True, the movement of the discs can be regulated to a minimum pace, but nevertheless and irrespective of the fact that he can use both his hands in guiding the sheet, the power-driven discs will push irresistibly forward, and if the operator is not quick enough in manipulating the sheet or becomes confused in the act, the cut might be away from the line and the piece of metal be spoiled. Operation of these power-driven rotary shears, there being no guides or gauges by which to cut the metal, requires infinitely more expertness than does shearing by other tools or in other machines. The discs have a tendency to *eat into* the metal at the point of least resistance, which is straight ahead, and this tendency the operator must anticipate and guard against.

Nibbling & Routing

Easier, though not as rapid, shearing on irregular lines may be accomplished in machines which operate on the *nibbling* or *routing* principles by a fast rotary motion of a drill-like tool. Here the operator is required to *press* the sheet against the tool, as the tendency of the tool is to push the metal away from the cutting face of it. The guiding is easier because the tool is like a pin, of a small diameter in the one machine and up-and-down moving in the other machine, in the first instance the sheet needing to be pressed horizontally against the rotating pin and in the second instance it remaining free of the ascending tool, unhindered by it in its movement on the platform. Both of these machines are power-driven, and of the two the nibbler is the more difficult to operate in that if cutting on irregular, non-gageable lines is the case, the line of cutting is entirely governed by the operator's two hands, and a slight deviation from the line or hand tremor might result in a cut spoiling the piece of metal or at least requiring additional processing. In circle and ring cutting by an attachment to the router, the shearing is not difficult but accurate and rapid, owing to the metal being held in the attachment and guided by it. This machine, especially so in circle and ring cutting in the heavier metal gages, does admirable service. The nibbler, on the other hand, does better work in the lighter gauges of the metals, softer metals especially, in that the guiding of the sheet consists of pressing it, according to its marking, against the rotary tool. In connection with both of these machines it is possible to construct locally certain guiding aids, as indicated in Fig. 4, although each specific job will call for its own auxiliary guides. All *stationary* shears or apparatus of this kind can be provided with gauging aids. Not so the hand-manipulated power shears or disc saws held in hand. In the use of these tools, efficient and rapid, the operator's guiding ability is the determining factor.

Saw Saves Time

The metal *saws* employed in a sheet metal shop consist of a hacksaw, which may be power-driven and adjustable to the cutting of angles, tubes and extrusions on various degree angles; of a stationary or portable toothed steel or carborundum disk saws, the first adjustable to the degree angle cutting and the second guided by the operator; and of bandsaws, of which there are several makes used in sheet metal fabrication. At letter "G" we indicate the cuts effected by either the adjustable hacksaw or the disk saws. These tools or apparatus are sufficiently known to the trade, if not from personal experience with them, from their use in woodworking or machine shops. Less familiarity attaches to the use of the *bandsaw*, although lately it is finding its way into the sheet metal shop. Bandsaws have been employed in large production, principally for trimming off surplus metal from die-formed parts, but the new makes of these machines admit of cutting solid steel in thicknesses as the machine accommodates, this sawing employed in the making of blanking dies and in cutting off chunks of the thick steel for other tools or dies. In sheet metal working, the common bandsaw found its uses in cutting lengths of pipe and other metal shapes in two, cutting on degree-angles and other such work. Latterly, the newer machines that will cut the solid steel are being employed in bandsawing *staked sheet metal*, as shown in Fig. 5. In this respect the bandsaw replaces an expensive die, in that it produces a quantity of the blanks which may be contoured to design both along their outer edge and interiorly, just as a

Fig. 5 Bolted sheets for bandsawing.

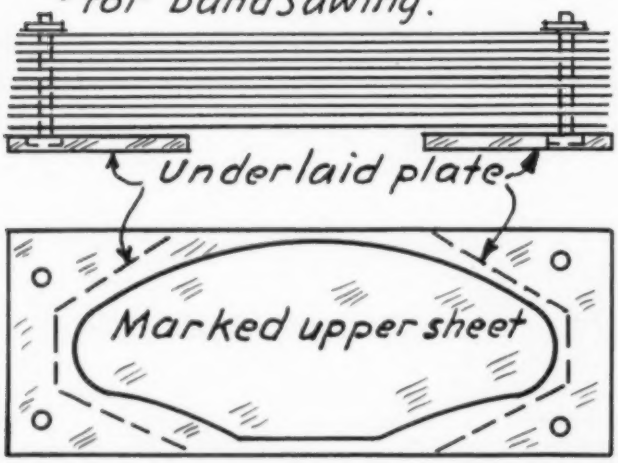
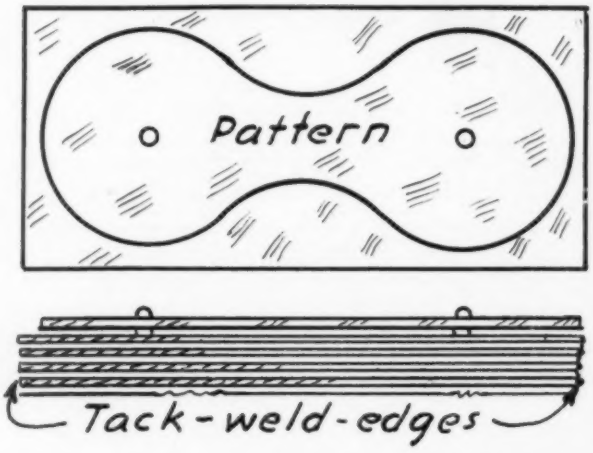


Fig. 6 Pattern riveted to upper sheet for band sawing.



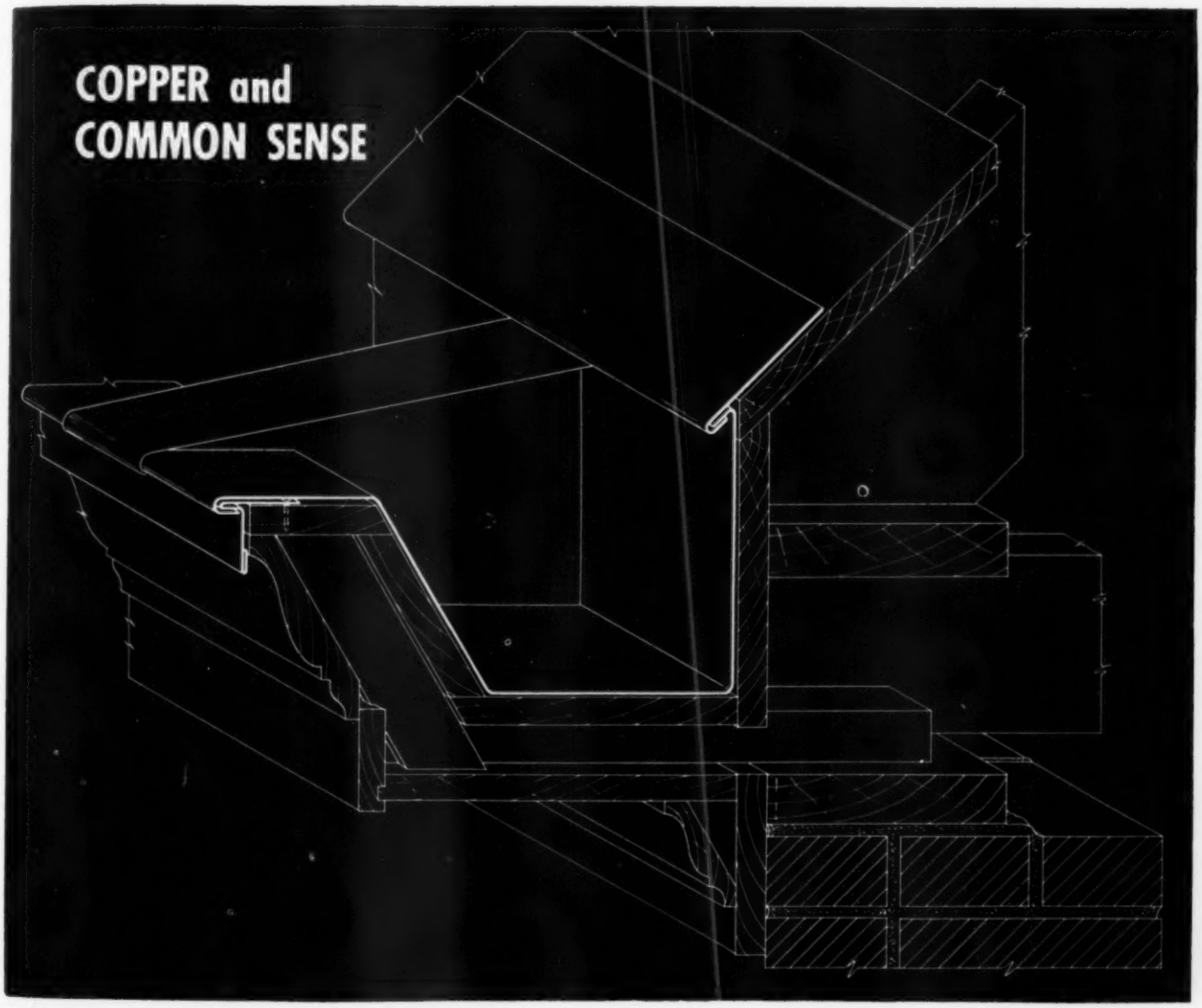
blanking die would do, with the difference that the bandsaw of the right make will produce as many as fifty 22 gauge blanks at one sawing operation, or at two sawing operations if the blanks are processed interiorly as well. Only the one, the uppermost layer of the sheet pieces, is *marked* with the lines on which to saw, as shown in Fig. 5.

Cutting of Multiple Blanks

Bandsawing exteriorly, along the perimeter of the desired blank, is done without the necessity of adjusting the saw blade, as the cut will start and terminate in the edge of the metal piece. For interior bandsawing it is necessary to cut the blade, insert it through a hole in the metal to be cut out, and then weld the blade. The newer machines are provided with a blade-cutting and blade-welding attachment, facilitating the work, and the blade may be cut, inserted, and welded in less than three minutes time. Surely, the operator must be versed not only in the manipulation of the bandsaw itself but also in the *guiding* of the staked metal along the marked line. A cut away from the line is here more consequential in that a great number of the metal pieces are processed at one time, the wrong cut being present in all of them. It is not advisable to bandsaw very thin metal, as it will bend under the action of the toothed blade, but any gauge of the sheets below 24 will be found stiff enough for such processing. In all respects the bandsawing of the metal will equal the shearing of it in the forementioned machines, though it might be slower. But if we *stake* at least five sheet pieces together, the blanking in a bandsaw will be more rapid, in the aggregate, that can be either rotary, shearing, nibbling, or routing. For satisfactory performance of the saw in sawing the staked metal, the sheet pieces must be held tight together, preventing their movement under the action of the blade. Bolting is the most satisfactory means of staking the sheets for bandsawing, using large diameter washers with the bolts, with underlayed metal, to even up the base of the assembly for reposing on the saw platform. If only a limited number of blanks is wanted, the sheets may be riveted together.

In preparation of the assembly of metal pieces for blanking by bandsawing we may follow the older practice of *tacking* the sheet edges by weld or brazing. The easiest tacking is done in the corner because here the metal is heated quicker, and if the four corners of the sheets are so fastened, that will be sufficient hold for the bandsawing operation. In larger quantity blanking by a bandsaw it will pay us to prepare a *pattern* of 3/16 or ¼ inch plate and rivet it to the uppermost sheet as shown in Fig. 6. The sheets may be tack-welded then as indicated. The pattern-edge should be *finished* smoothly, the smoothness causing the saw blade to glide over it without cutting into it. A pattern made of a heavier gauge metal, with the edges finished smooth as above said, will be a much safer guide in bandsawing than can be the operator's dexterity in manipulation of the staked metal because the right pattern will hold the blade away from cutting past the line, while the operator might become distracted by other shop activities, or bumped against, or the blade might encounter a more *hardened* spot in the metal's grain structure, either of these eventualities tending to the operator's loss of control over the sawed material. If we have a rotary nibbler in the shop as indicated in Fig. 4, we may stake several sheets of metal, but not more than the cutting tool will accommodate, and use the above pattern arrangement to advantage also in this connection, riveting or edge-tacking the pattern to the uppermost sheet and dispensing with the more elaborate and more troublesome arrangement shown in that figure. Jobs are of many natures, one differing from the other, and it is best to study each new job independently of the older jobs and the older practices, arriving at the most simple, least expensive, best performing means employable in guiding the nibbling tool or the saw blade. There are a number of ways in which to construct and make use of these *guides*.

We shall refer back to the various modes of shearing-cutting-sawing as we proceed with the subsequent operations in sheet metal working or fabricating, the next article in this series dealing with *interior* blanking, such as done in a punch press, in a drill or blanking press, and as might be done, under certain circumstances, by the rotary shears or nibblers or by bandsawing.



QUESTION: What is the best way to determine locations of expansion joints in sheet copper construction?

ANSWER: Use the chart on page 28 in "Copper and Common Sense"

A CHART which makes it easy for you to determine the correct gauge copper for any gutter lining as well as the maximum distance that may safely be used between an expansion joint and a fixed point is one of the important results of Revere's extensive sheet copper research program. This chart and simple instructions for using it are on pages 28-29 in Revere's 96-page book, "Copper and Common Sense."

This booklet is filled with new facts which enable you to design or install gutter linings, flashings and roofs that give *extra* years of service. It is complete with charts, illustrations and detailed information so arranged that you can read and apply final figures that insure the finest sheet copper construction.

This book has been widely distributed to architects and sheet metal contractors, and in all probability it is in your office files. Be sure to refer to it. If you do not have a copy, write for one now on your office letterhead.

For further information or assistance with the design or installation of sheet copper, the Revere Technical Advisory Service, Architectural, will be glad to help you.

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Triples Production With "Fleet-Welding" Technique

BY M. BOGIN, PRESIDENT
EAGLE SHEET METAL MANUFACTURING COMPANY
CHICAGO, ILL.

IN the arc-welded fabrication of cabinets for teletype printers, we have tripled our production by adopting Lincoln "Fleet-Welding" procedures. Fig. 1 shows three stages in the cabinet production—the component parts at left, the welded assembly in the middle, and the finished cabinet with welds ground off at right.

Formerly we used a 3/32" E6012 electrode with straight polarity for joining the 16-gauge mild steel pieces. Now we use 1/8" size "Fleetweld 5". The trick is to use this normally "reverse polarity" electrode with "straight polarity", in other words, with the electrode negative and the work positive. Also it is desirable to tilt the joint so as to weld slightly downhill. All welding is done in a fixture (shown in Fig. 2) which clamps the pieces into tight fit-up and allows positioning for welding downhill at an angle of about 30°. As a result, we weld three times as fast, the welds are stronger and pin holes are eliminated. Also, the flat bead of "Fleetweld 5" reduces grinding by one-half.

The parts are stamped and formed in die presses. The main welds are those joining front panel to sides (see Fig. 1), two joining the back top corners and two small flange inserts at back, bottom. All joints are butt

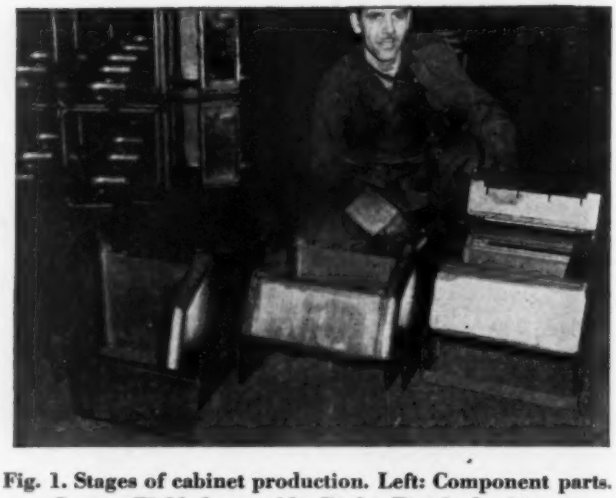

Fig. 1. Stages of cabinet production. Left: Component parts. Center: Welded assembly. Right: Finished cabinet.

with good fit-up and copper back-up. Welding is done from the outside only and penetrates 100%.

In developing this procedure we had the assistance of the local Lincoln engineer. To obtain welding assistance, or a free copy of Bulletin 440 describing "Fleet-Welding" procedures for all thicknesses of mild steel and all types of joints, manufacturers should call the local Lincoln engineer or write THE LINCOLN ELECTRIC COMPANY, Dept. 174, Cleveland 1, Ohio.

Fig. 2. This fixture permits positioning for downhand welding throughout.

Fig. 3. Grinding the welds is now 100% faster due to flatter bead of "Fleetweld 5".

Advertisement

SMCNA Labor Relations Committee Meets

A SUB-COMMITTEE of the National Labor Relations Committee of the Sheet Metal Contractors' National Association, Inc., met with a similar committee from the Sheet Metal Workers' International Association on July 9, in St. Paul, to consider the seven items suggested at the last convention, plus a number of other more recent important items. Representing SMCNA were Chairman Roy Dose, Louis L. Narowetz, W. A. Wiedenmann, A. J. Dalton, M. A. Thesmacher, with J. F. Higgins of St. Louis serving as alternate for W. H. C. Ness of Los Angeles. National President R. E. Walsh sat in as observer and Secretary J. D. Wilder acted as secretary of the meeting.

The primary aim was to explore the possibility of obtaining a uniform agreement throughout the country on overtime pay, premium pay for night work, and number of apprentices.

Attorneys for the union are now revising and rewriting the Standard Form of Union Agreement to conform with legal interpretations of the Taft-Hartley law and when this revision is ready and before the new agreement is distributed for signing, the SMCNA Labor Relations Committee will once more sit down with labor and discuss the new agreement and again submit requested items for consideration.

Items Discussed

Item 1—Jurisdictional Protection—Labor is asked to assist by encouraging contractors to take heretofore passed-up work and to supply sufficient qualified mechanics to do the work. Within present interpretations of the Taft-Hartley Law, labor will cooperate.

Item 2—Bona Fide Shop—Definition is needed—employers suggested—a shop where the employer is willing to train one or more apprentices.

Item 3—First Call on Labor—SMCNA Committees propose that bonafide shop employers shall have first call on available union labor. This proposal is in effect in many areas, and while labor agrees in general, again this must be examined for conformity with the T-H law.

Item 4—Overtime Pay—SMCNA Committee proposes "All work beyond the standard 8-hour day and 40-hour week shall be considered 'overtime' and shall be at a rate of pay of time and one-half." Labor said such a nationally uniform clause violates local union autonomy. Committee's suggestion that in the new agreement the rate of overtime shall not be printed in, but left to local agreement as are wages, appears to be a good possibility.

Item 5—Premium Pay for Night Work—SMCNA Committee proposed "For the one 8-hour period between 5 p.m. and 8 a.m., the premium pay for field work, shall be at the rate of pay of time and one-quarter." No agreement was arrived at, but perhaps like Item 4 can be a local agreement.

Item 6—Apprentices—SMCNA Committee proposed "It shall be mandatory to abide by the apprentice agreement entered into by SMCNA and SMWIA in joint discussion in February, 1947." SMCNA and SMWIA are in agreement.

Note.—The Apprentice Training Program agreed to provide among other things—"apprentices shall be indentured by the Joint Apprentice Committee and there can be in any given area served by the local union one apprentice for every four journeymen, also, the committee may assign an apprentice to a shop having only one journeyman plus thereafter, a ratio of one apprentice to every four jorneymen."

Item 7—Trainee—SMCNA Committee proposed "That there shall be a sufficient supply of labor, it is necessary that labor and employers recognize the need for the 'Trainee' and that a clear definition of a trainee be agreed upon and that rules be established to cover the obtaining, training and employment of the trainee." This subject must have further discussion.

Item 8—School for Labor Relations Committeemen—SMCNA Committee announced a proposal to establish a school of instruction for the training of employer representatives on labor relations committees, and asked labor to consider similar schools. Labor pointed out that business representatives are elected. This will be considered later.

Item 9—Ninety Day Notice—SMCNA Committee proposed "No change in a contract shall be made unless Article 10, Section 1 of the Standard Form of Union Agreement shall have been complied with and in exact accordance with the notice for change ninety days prior to the expiration of the agreement." Agreed, subject to mandatory changes because of T-H law.

In general, it seems likely that agreement can be reached on practically all of the items proposed by the SMCNA Committee, when the T-H Law is interpreted.

Article Two in New Contract

The new Standard Form of Union Agreement contains these words, "...including all drawings necessary for the fabrication and erection . . ." (Article two describes the employees who shall be covered by the agreement). At the July 9 labor relations meeting the interpretation of these words was agreed upon and signed for by Chairman Roy Dosé and General President Robert Byron of SMWIA.

"The words 'including all drawings necessary for the fabrication and erection' shall be defined as referring—only to a practical sheet metal man who takes the employer's engineering layout and by visiting the job checks the engineering layout and prepares shop drawings from which the final work is fabricated. These words shall not be defined to mean the engineer or engineering draftsman of the sheet metal contractor who takes the customer's mechanical drawings and from these prepares the drawings the contractor uses for pricing or submits for customer approval."

The National Labor Relations Committee suggests that in areas having a Joint Adjustment Board the above wording shall be attached to or written into the Standard Form of Union Agreement as a rider. In areas where there is no Joint Adjustment Board, this interpretation should be shown to the local business representative of the SMWIA and agreed to by him in writing.

Clarence J. Meyer, National Secretary

ASSOCIATION ACTIVITIES

NWAH&ACA

A PLAN to improve the performance of forced warm air heating systems was considered by the Application and Engineering Advisory Committee in a called meeting at the Congress Hotel, Chicago, July 22. The plan was presented by E. B. Lau of Dayton, Ohio, and after discussion the committee unanimously agreed that the plan was both feasible and highly desirable to safeguard the best interests of the warm air heating industry.

It calls for promoting a simple service procedure, proved by recent engineering methods advocated by the National Warm Air Heating and Air Conditioning Association, to adjust blowers, controls and balancing as insurance of maximum *Indoor Comfort* from Winter Air Conditioning systems. Mr. Lau proposed a concerted nation-wide educational and service program in order to acquaint the public and the dealer with the improved results attained from correct adjustments. It is expected that all manufacturers and jobbers connected with the warm air heating industry will endorse and support the plan through cooperating dealers who subscribe to the objectives of the plan. A charge by the dealer commensurate with improved performance is to be advocated whenever the service is rendered on existing systems.

It is hoped the program, promoted intensively this fall and winter, will result in more wide-spread acceptance and endorsement of winter air conditioning systems by the public and also serve as a standard for correct adjustment of new installations.

Three sub-committees were appointed with assignments covering consumer promotion, dealer education and merchandising. Before adjournment each subcommittee reported preliminary recommendations which were accepted in principle.

Institute's Second Educational Program

THE Furnace-Air Conditioning Sheet Metal Institute announces a 12-week course in automatic heating at their Research Home located at 1916 Fullerton Avenue, Chicago. Classes started Tuesday, September 2, at 7:30 p. m., and will continue for twelve consecutive Tuesdays.

On-the-Job Heating Problems

The course will begin with a short review of last year's instructions on figuring heat losses of a typical home. Thereafter, it will take up the complete installation of a forced air, oil-fired furnace with zone controlled trunk lines in a typical residence and also in the Research Home. Throughout the instructions, actual work in the Institute's Research Home will be carried on to give practical facts in the work covered.

The course is under the direction of William Bard, professor in warm air heating from the Chicago Technical College, and a former practical heating man.

Members in good standing are admitted free, and member's employees pay $10.00 each. Non-members and their employees will pay $15.00 each. Non-member contractors are given the privilege of affiliating with the Institute without initiation fee, if they take the course.

The promoters of the school are the Institute's Educational Committee—Barney Sanders, Chairman, Louis Drehobl, Tom Novak, Rudy Guenther, Lou Reining and Ed Carter.

Barney Sanders, Chairman
Institute Educational Committee
5322 W. Belmont Ave., Chicago.

National Heating Wholesalers

THE first convention of the National Heating Wholesalers Association will be held at the Hotel Cleveland, Cleveland, Ohio, on December 3, 1947. This day is one day prior to the convention of the National Warm Air Heating and Air Conditioning Association. Every legitimate wholesaler of heating equipment is invited.

This group is animated by the hope that through their association they can solve problems and cure evils that pester them. A few of the objectives are:

1. Bring before the industry any matters tending to improve business conditions and efficency.
2. Promote cooperation by—
   (a) Instituting an educational program.
   (b) Training salesmen.
   (c) Providing merchandising technique instruction.
   (d) Teaching modern bookkeeping methods.
   (e) Giving advertising helps.
3. Promote standardization and simplification of the products of the industry.
4. Discuss trade customs that are, or may become established, such as:
   (a) Uniformity in cash discounts.
   (b) Proper functional discounts.
   (c) Fair freight allowances.
   (d) Selling Utilities; Tax-free Co-operatives; and Manufacturer's Agents.
5. Promote activities relating to improving purchasing practices.
6. Collect and disseminate statistical and other information pertinent to our business.
7. Publicize legislation applicable to the industry and the requirements of the laws pertaining to the businesses of our members.
8. Lend our offices in matters of arbitration to settle disputes.
9. Facilitate inventory protection and interchange.
10. Secure localized credit information.

The above objectives have been enumerated by a group of heating wholesalers, no one of which is seeking personal gain, and many are serving at considerable sacrifice.

An application for membership blank may be obtained by writing J. E. Eckstein, secretary-treasurer, 526 Galveston Avenue, N. S., Pittsburgh 12.

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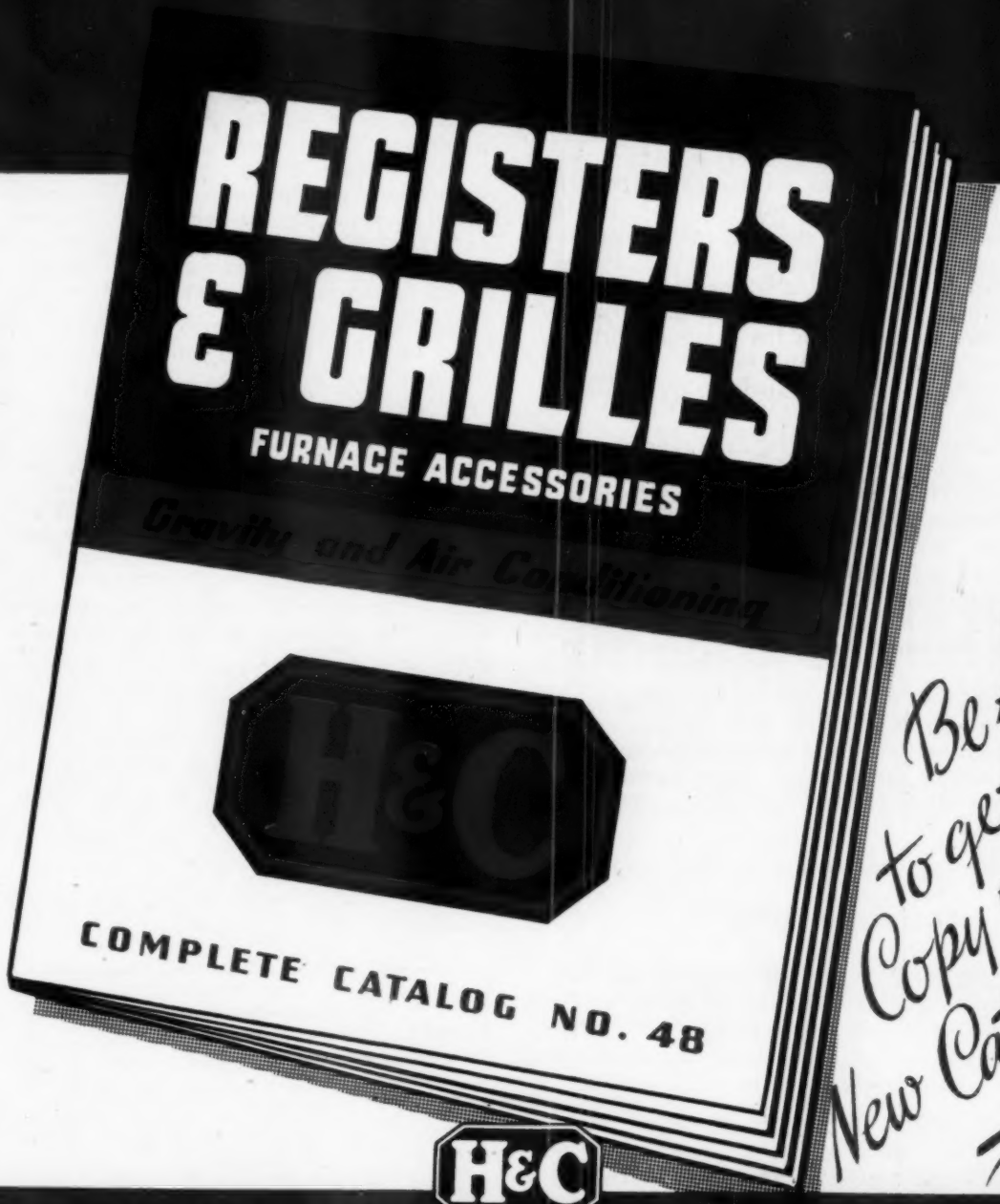
EVERY REGISTER ADVANTAGE AN INSTALLER COULD WISH FOR!

The line you will find presented in the new H & C catalog has been streamlined to give you the edge in EVERY situation — whether the objective be the maximum of efficiency, regardless of price, or meeting competition on the low-priced jobs without sacrificing customer good will. You'll find this catalog a reliable guide to the best register for every type of installation. If you haven't already received your copy, by all means ask your H & C Jobber for one or write direct to us.



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Association Activities . . .

Indiana

THE regular quarterly meeting of the Board of Directors of the Sheet Metal and Warm Air Heating Contractors Association of Indiana, Inc., was held in the Hotel Severin, Indianapolis, on July 12.

All members stood in silence in honor of our departed Vice President, Blount L. Schlemmer.

Roll call found all officers and directors present excepting "Old Reliable" Homer Selch, treasurer, who phoned his regrets at being unavoidably detained by a rush government job at Fort Harrison.

It was another long session due to important committee reports and new business.

The thirtieth annual convention will be held Thursday and Friday, the second week in February, if agreeable with hotel management.

All programs of benefit to the warm air heating and sheet metal industry are being forwarded by the state association in cooperation with other organized groups. However, final results depend greatly on individual cooperation.

All members are requested to write their Senators and Congressmen to use their influence with the House Ways and Means Committee to favor tax equality legislation in order that Co-ops and other exempts shall be required to contribute the same support to our government as their competitors.

The tax reduction bill is estimated to save Hoosiers over $72,000,000 in 1948.

The Bulletin for August will contain a reprint (two pages) of an editorial, "The Co-ops Grow Up," from the Indianapolis Times of June 17, with pertinent industry information and some gleanings and rambles here and there.

New members and reinstatements are requested to send their 1948 dues at once to Frank E. Anderson, secretary, 439 S. 17th St., Terre Haute, Ind., in order to receive full membership from date to December 31, 1948.

The new directory of Indiana dealers selling heating equipment and sheet metal now contains nearly 700 firms, which indicates it is probably one-half complete. Preliminary listings are being released on orders for complete directory, which will be limited in quantity.—Frank E. Anderson.

St. Joseph Valley

THE St. Joseph Valley Sheet Metal and Contractors Association held their annual picnic at the Izaak Walton League Club House on June 6th. Prizes were donated by all the sheet metal organizations. Games and contests were enjoyed by young and old.

On July 7th the association held its monthly meeting for election of officers.

James Walker was re-elected president; Russell Sisson, vice-president; Joseph Lauber, Jr., treasurer; and Burton Walker, secretary for the coming year.

The next meeting will be on September 8, 1947, when the new officers are to be installed in their respective offices.—William R. Tesky, Publicity Editor.

New York City

THE Roofing and Sheet Metal Crafts Institute, having devised a Code of Ethics, is now working on an extensive plan whereby simplified and more standard methods of operation will make it easier and more effective for members to conduct business activities. Each member will have a handbook into which he can place certain forms to be devised in connection with billing, estimating, reports or other phases of the business.

Ladies night, at which time the wives and friends of members get together and get better acquainted, has been postponed until fall.

Stoker Manufacturers

AT the thirtieth annual meeting of the Stoker Manufacturers Association on June 16th at Lookout Mountain a competitive fuel outlook was presented showing an average saving in twelve cities on a Btu basis—one ton of stoker coal with a calorific value of 13,000 Btu per pound being equivalent to 185 gallons of fuel oil at 140,000 Btu per gallon. The average saving in the twelve cities, by comparing the selling price of fuel oil per gallon with an equivalent price of oil to coal, is 42 per cent.

Similarly, gas is compared with coal in the Great Lakes area and coal is found to save 23.3 per cent over gas.

Carolinas

THE September issue of "The Carolinas Roofer" continues the talk given before the June convention on "New Business in Stainless Steel for the Sheet Metal Contractor" by Robert M. Nelson, Marketing Service Department, Market Development Division, The American Rolling Mill Company.

There is also a letter written to Senator Wilson in Washington on the "Gray Market in Nails" by Frank R. Nichols of Nichols Wire & Steel Company, and calling attention to the bitter resentment rooted to the fact that steel finds its way from producing mills into the hands of opportunists and speculators who capitalize on the situation by charging outrageous prices at a time when legitimate users are unable to get steel at mill prices from the producing mills.

J. A. Piper, Editor

(*Continued on Page* 158)

Coming Conventions

1947

Dec. 3—National Heating Wholesalers Association. First Annual. Hotel Cleveland, Cleveland. E. J. Eckstein, Secy.-Treas., 526 Galveston Avenue, N. S., Pittsburgh 12.

Dec. 4-5—National Warm Air Heating and Air Conditioning Association. 34th Annual. Hotel Cleveland, Cleveland, Ohio. Geo. Boeddener, Man. Dir., 145 Public Sq. Bldg., Cleveland 14.

Offer the Savings Provided by PENN Streamlined Installations

Lots of customers whose "dream heat" is a packaged boiler-burner unit of good quality are scared off when the dealer quotes price. Many profitable sales now being lost can be captured by featuring PENN *Packaged Heat*. The price difference between PENN *Packaged Heat* and other quality units is enough to turn many a "walk out" into a sale.

PENN'S lower cost does not slice a dime from your profits or reduce quality by a whisker. PENN *Packaged Heat*—for oil or gas firing—is the only automatic boiler-burner unit *delivered with all parts and controls mounted and wired at the factory.* As a result, savings in installation costs can be passed on as a lower price to your customers.

PENN *Packaged Heat* provides automatic year-round hot water without the cost of a separate water heater. Plug it to get more of those sales you may be losing by just the margin of higher installation costs!

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For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 157 and mail to us.

121—Improved Hammer

An improvement has been made in the Kant-Mar hammer. Tips of the Kant-Mar are made of a precision turned special aluminum alloy called "Velv-Alum," easily replaceable. Velv-Alum is a new material sufficiently tough yet soft enough not to mar the most delicate surfaces.

Velv-Alum also reduces the chance of eye injury due to chipping, and the Kant-Mar is balanced to practically end rebound accidents.

The handle is of selected grade hickory. Head has an oval hole (not round) for handle.

The Kant-Mar is made in two sizes: 8 and 32 oz. in a plain model (non-replaceble tips), and in the same sizes in a model with replaceable tips. Additional 8 and 32 oz. tips may be obtained separately.—*Schmidgall Products, 307-11 Cass Street, Peoria 2, Ill.*

122—Electrode No. 13

A new electrode, No. 13, has been designed to simplify the welding of light gauge mild steel.

Low penetration, ease of handling and steady, uniform transfer of metal all contribute to make this electrode extra fast for out of position welding on light gauge sheet metal. It is also recommended for welding light sections of mild steel to heavier ones.

This electrode is designed for use with dc straight polarity or ac, and is available in 1/16, 5/64, 3/32 and ⅛ in. diameters.—*The Hobart Brothers Co., Hobart Square, Troy, Ohio.*

123—Alodine

Alodine is offered for corrosion-proofing and anchoring paint to aluminum and its alloys. Alodizing is essentially a chemical process.

Aluminum to be Alodized is treated not over two minutes in a chemical solution heated no higher than 120 deg. F., then dried if to be unpainted, or rinsed if the work is to be painted or waxed.—*American Chemical Paint Company, Brookside Ave., Ambler, Pa.*

124—Norge Heat

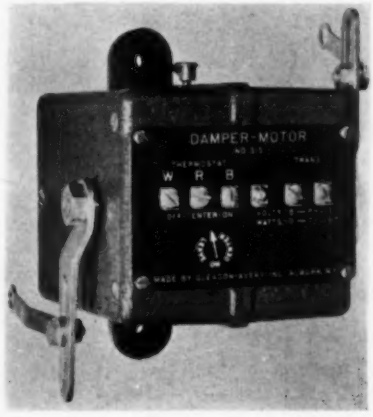
A new furnace in 22, 24 and 27-inch inside body diameter—bonnet outputs from 108,000 to 154,200 Btu. an hour—is suitable for heating five to ten-room homes; is designed for conversion to oil or adaptation to stoker-feed operation.

Features include a unique casing attachment system; casing sheets are hooked to front moulding and

tightened with a draw band; furnace body is of heavy steel boiler plate, electrically welded seams; grates are heavy duty locomotive type; heating surfaces for the furnace body and "oversize" radiator are vertical to extract maximum heat; humidifier is of porcelain, located in the furnace casing hood. The furnace is equipped with a chain regulator and check damper.—*Norge-Heat Div., Borg-Warner Corp., 574 E. Woodbridge St., Detroit 26.*

125—Damper Motor

A new motor has been designed, primarily to control the draft and check dampers on hand-fired heating systems. Designed as No. 315, it is the rotating arm type, having



a three-wire control circuit, and is mounted on rubber grommets.

Bearings are oil-retaining porous bronze. A hand switch permits manual operation during firing periods.

The No. 315 motor operates on 20 volts, 50-60 cycle. Zinc cast case is finished in red crackle. Maximum load at extreme radius is 20 pounds. Overall dimensions are: height, 3⅜ in; width 3½ in; depth, 5-11/16 in. Weight is 3¾ lbs.—*Gleason-Avery, Inc., Auburn, N. Y.*

126—Luminous Flame

The Iron Fireman has turned oilman with the Luminous Flame Vortex oil burner that is especially designed to work well in furnaces originally handfired. This burner produces a flat, bowl shaped flame that blankets the hearth and walls of the combustion chamber—the same type of fire for which the hand-fired job was built.

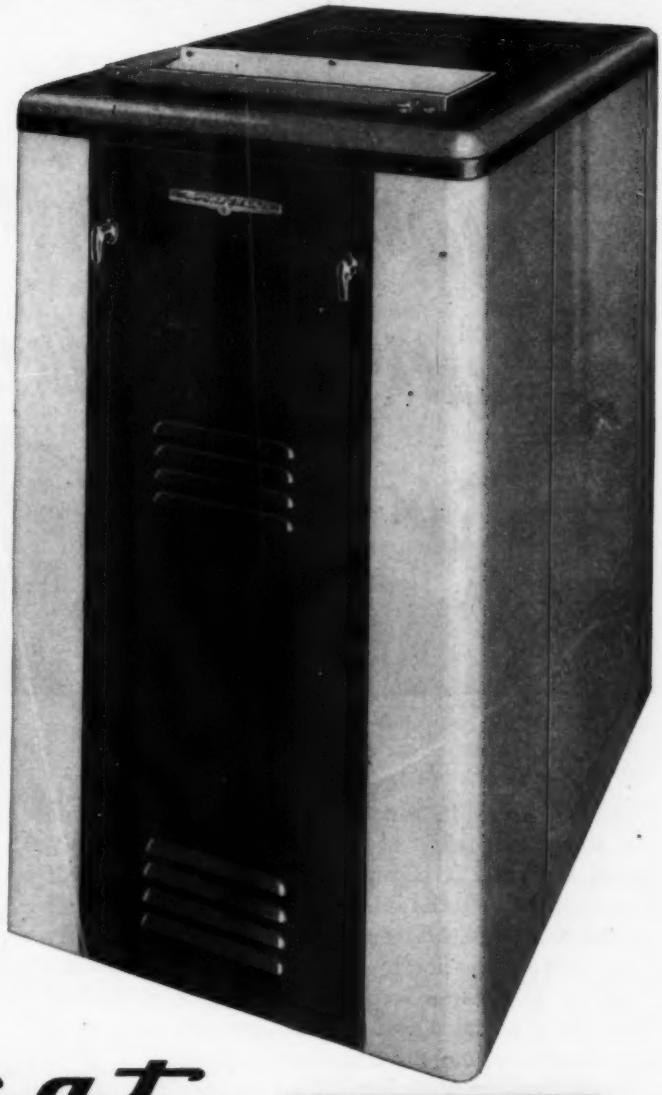
The company's research has indicated that the radiant heat from this type of flame is more readily absorbed by the heating surfaces than is the heat of hot combustion gases.—*Iron Fireman Manufacturing Co., 3121 W. 106th St., Cleveland 11, Ohio.*

"OLD FAITHFUL"—
YELLOWSTONE PARK

PROVED-

MOST DEPENDABLE

What do your customers want most in their heating plants? Doesn't dependability come first? If so, Norge Heat is first choice, proved by reports of years of outstanding dependability, as thousands of users will testify.



WHY HAS THIS PROVED TO BE THE BEST?

Here are a few of the reasons why these oil-burning winter air-conditioning models with vacuum-draft are better, more economical, more dependable—

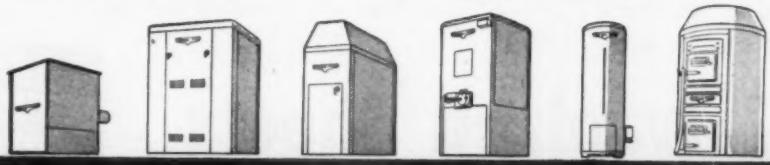
- **Improved Design:** No "over-ride" . . . no heat lost up stack on off-cycle. A minimum of moving parts simplifies installation and service.
- **Exclusive Vacuum-Draft:** Pulls air through the combustion chamber. No oil fumes can enter the air-circulating system, because the pressure in the combustion chamber is always lower than the house air pressure.
- **Norge-Heat "Whirlator" Combustion Head:** Patented head mixes fuel and air with automatic precision to assure new stability and maximum economy.
- **Single Motor Operation and Stainless Steel Refractory:** Guarantee instant response to the thermostat, thus eliminating "cold 70°" and assuring maximum economy.

All of these, and other revolutionary advancements in every unit in the complete Norge Heat line, are backed by *both* NORGE HEAT and BORG-WARNER. For further information, write—

CONTROLLED COMBUSTION

Norge Heat

Division of Borg-Warner Corporation • 574 East Woodbridge St., Detroit 26, Michigan



ENGINEERING B-W PRODUCTION

SEE Norge Heat BEFORE YOU BUY

Producing Nylon yarn in an atmosphere of controlled humidity at Lehigh Valley Throwing Mills. The air is circulated through ceiling ducts made of Beth-Cu-Loy Galvanized Steel Sheets.

Humidity control in a modern throwing mill improves the running quality of yarn as it spins on high-speed bobbins. It eliminates the static snarls that happen when fibres are too dry. It reduces the breakage of the filament-like material that occurs when there is too much moisture present.

These advantages explain why proper control of humidity is a "must" for smooth, low-cost production in the highly-competitive textile industries.'

Ducts that circulate humidified air in plants of this type must be able to withstand more than average corrosive conditions. That is why Beth-Cu-Loy Galvanized Steel Sheets are specified for ductwork in many of the country's leading textile mills. Beth-Cu-Loy Sheets have a copper-bearing steel base whose resistance to rust is from 2 to 2½ times that of ordinary carbon steel. In addition, they have a bright, even coating of Prime Western zinc that acts as an outer protective armor against corrosion.

Whenever you figure on an industrial air-conditioning or humidity-control job remember Beth-Cu-Loy Galvanized Sheets will give far longer service—and cost very little more than ordinary sheets.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

Beth-Cu-Loy Galvanized Sheets

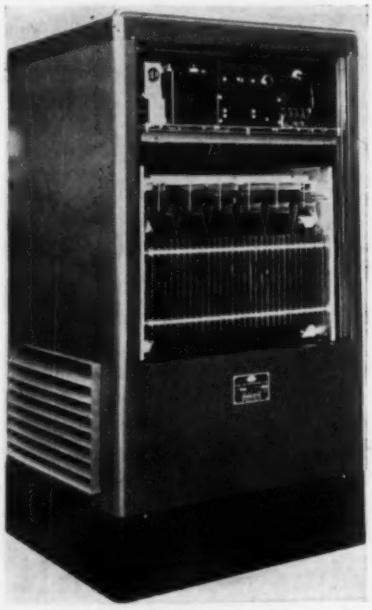
BETHLEHEM STEEL

Equipment Developments.....

For your convenience in obtaining information regarding these items, use the coupon on page 157.

127—Precipitator

The home precipitator is a small version of the industrial precipitator, employing the latest engineering developments, designed to remove airborne dirt when used in conjunction with a warm air furnace or an air conditioning unit. It



removes not only visible dirt, but microscopic particles as small in diameter as 1/250,000th inch.

The precipitator consists of the "power pack" and the heart of the unit, the "Ionizer-collector" cell.

The precipitator is 54 inches high, 28 inches wide and 27 inches deep, and weighs 300 pounds.—*Raytheon Manufacturing Co., 60 E. 42nd St., New York 17.*

128—Gas-Line Tubing

Resumption of the production of aluminum tubing approved by the AGA is announced. This tubing is supplied in 2S-O and 2S-½H aluminum in outside diameters ranging from ¼ to 1⅛ in.

For connecting gas appliances to house piping, wall thicknesses range from 0.049 in. for the ¼ to 5/6 in. OD tubing, inclusive; 0.058 in. for the ¾ OD; and 0.065 in. for the ⅞ to 1⅛ in. size.

Nominal weight for this aluminum tubing ranges from 0.026 to 0.257 pounds per lineal foot.—*Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.*

129—Cleaner-Blower

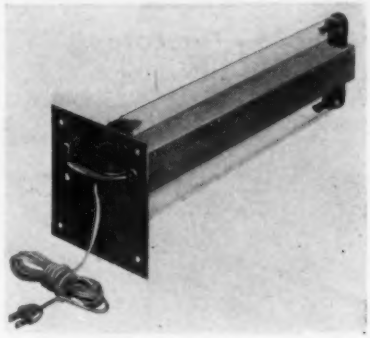
A completely redesigned portable electric cleaner-blower which vacuums, blows, sprays or dries is announced. Powdered with a 1⅓ hp motor, the Ideal heavy-duty cleaner blows at a velocity of 25,500 fpm and weighs 14½ lbs. The medium duty cleaner, with a ⅔ hp motor displaces air at 19,000 fpm and weighs 9½ lbs. Both models have precision type, sealed ball bearings and air stream cooling scrolls.

The Ideal may be used as a sprayer for deodorants, insecticides —for paint, varnish, lacquer, etc. If drying action is desired, a heater nozzle may be attached to raise the air flow temperature to a minimum of 85 degrees.—*Ideal Industries, Inc., 1084 Park Ave., Sycamore, Ill.*

130—Sterilator

The Sterilator, the germ killing unit designed for the home, is available now, a single unit to be installed in the *ventilating system.*

The Sterilator incorporates the G-E Germicidal Lamp. This lamp is an advanced development in the use of the ultra-violet ray as a germ



killing medium, reducing to a minimum air borne infection and cross infection.

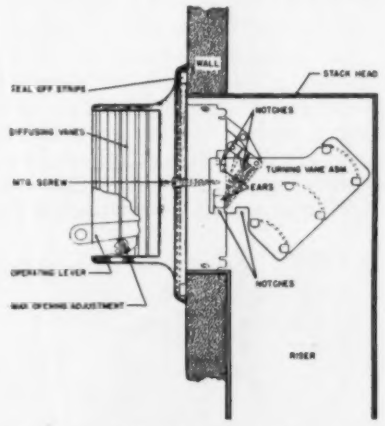
The Sterilator, with the germicidal lamps, bathes the air with its ultra-violet germ killing rays as the cold air is drawn in through the vents and before it passes through the heating system.

This fixture deodorizes as well as disinfects. Installation in the air duct eliminates direct contact with the powerful ultra-violet ray, which can be harmful to eyes, skin and fabrics.—*Domestic Devices, 1495 Warrensville Road, Cleveland, Ohio.*

131—500A Register

A new air-conditioning register, now in volume production, combines a number of features—manual volume adjustment, shut-off damper, and stackhead turning vanes within a single unit.

The extended curved design of the diffusion vanes provides maximum reduction of the register



velocity without excessive resistance or dampering effect.

Fingertip control of air volume is accomplished by a lever on the register itself. Complete shut-off of the register is also a function of the volume damper. An adjustment lock for the manual control lever permits the register to be closed and re-opened without disturbing the system balance.

The register comes equipped with a rubber seal to insure streak-proof operation; is suitable for high or low wall installation or new or existing heating systems. Standard sizes of 10x4 in., 12x4 in., and 14x4 in. are now in production. A prime coat finish simplifies stocking requirements. Return grilles of complementary sizes are included in the system—sizes 10x6 in., 14x6 in., and 30x6 in.

Factory set at 120 degrees air pattern, the register may be adjusted for 45 and 90 degree air patterns with a key and template, included in the packing cases.—*Minneapolis-Honeywell Regulator Company, 2726 Fourth Ave., South, Minneapolis 8, Minn.*

132—New Moncrief

A new-type paneled cabinet with vertical and horizontal interlocking slip joints, a die-formed radiator welded by the new, submerged arc welding process, and a firepot with adjustable retaining band for properly fitting firebrick, are features of the new steel gravity Moncrief coal-fired furnace.—*The Henry Furnace Company, Medina, Ohio.*

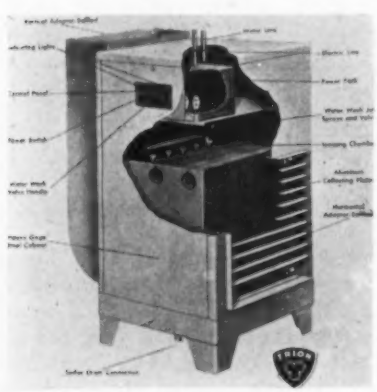
Equipment Developments.....

For your convenience in obtaining information regarding these items, use the coupon on page 157.

133—Home Precipitator

An electric air filter for domestic use, in two sizes is available. Model 100 for homes up to 7 rooms and Model 200 for homes up to 11 rooms.

The unit consists of a metal cabinet, a series of 59 parallel aluminum plates called the collecting chamber, a screen consisting of six fine wires suspended between aluminum tubes called the ionizing screen, a power pack with



transformers and rectifier tubes for supplying high voltage direct current to the ionizing screen and collecting chamber and a jet spray system for the collected dirt.

Controls are simplified—*Trion, Inc., 1000 Island Ave., McKees Rocks, Pa.*

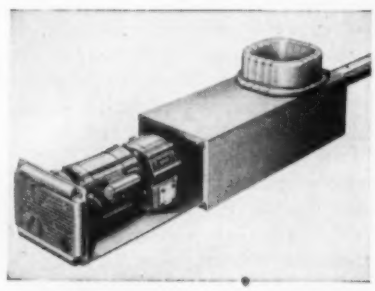
134—Heater

Double banks of crisscross tubes directly over the fire are features of a new forced air heater with output capacities from 123,000 to 5,000,000 Btu. Confined air streams travel through the multiple tubes at high velocity, giving high heat transfer from fire chamber to the air streams in the tubes. The force behind the air streams that pass through the air heating tubes is supplied by a blower and the air heating tubes are divided off by dividing plates so that a slight static pressure is formed at the lower ends of air heating tubes or the old air space. A flue gas control restricts chimney heat loss. All welded construction.

The system lends itself to added features—cooling, dehumidifying, air washing, etc.—*Johnson Heater Corporation, 12 Newhall Ave., Saugus, Mass.*

135—Unifeed Burner

A new bituminous automatic coal burner—the Unifeed—with 15-pound per hour coal feed capacity, has a fan, transmission and motor in one unit, mounted together on a steel plate, so that the mechanism



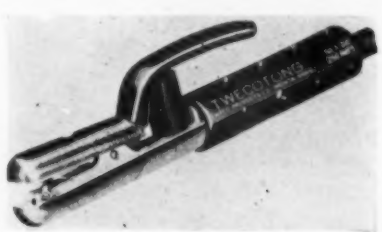
becomes a "drawer" that slides into a steel compartment.

Coal is fed automatically from bin to fire to maintain the thermostat temperature setting. An automatic, air-measuring device—the Air Meter—is a part of the operating mechanism. Direct drive eliminates sheaves and belts.

The Unifeed is designed for the small home.—*Link-Belt Company, The Stoker Division, 2410 W. 18th Street, Chicago 8.*

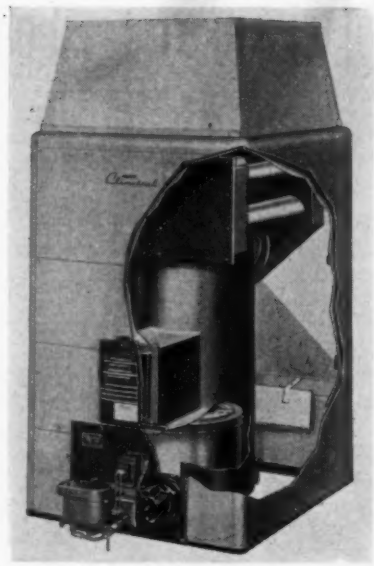
136—Twecotong

The A-316 Twecotong is a smaller companion to the A-14 and A-38 holders. The A-316 features light



weight, compactness and ease of operation with a 95 lb. bite on a 3/6 in. electrode.

The tip and body insulation is molded, laminated glass cloth Bakelite, using the patented "Tubular-Keyed" design. The insulated spring is Neoprene covered. The cable connection is a simple clamp, plus socket for soldering. Capacity 1/16 through 3/16-in. electrodes; 250 amperes; weight 18 oz.; length 9 inches.—*Tweco Products Company, English at Ida, Wichita 1, Kan.*



137—Climatrol

Two new oil-fired units have been added to the Climatrol line—Type 201 gravity and Type 202 winter air conditioner.

Type 201 is available with inputs of 90,000 and 135,000 Btu. per hour. Type 202 has inputs of 100,000 and 150,000 Btu. per hour. Both furnaces are designed to burn gas as well as oil, having identical gas-fired ratings. A packaged gas burner assembly is available whenever it is desired to fire with gas.

Both employ the same heavy-gauge steel drum and tubular radiator of multiple-pass design, with two banks of staggered radiator tubes. Travel of the products of combustion is "updraft."

Cabinets are fabricated from heavy-gauge steel and finished with green crinkle lacquer. Inside finish is aluminum. Type 201 has an aluminum finished bonnet.—*L. J. Mueller Furnace Company, 2005 W. Oklahoma Ave., Milwaukee 7.*

138—Duct Damper

Kaustine has attempted to solve the problems of stratification and cold floors thru use of helix control dampers in the warm and cold air ducts at the top of the furnace. Principal of operation is that the blower will continue to deliver heated air as long as the air is above 80 degrees (though at a reduced velocity as the dampers close) but when the air drops below 80 degrees the damper will be shut off by the bi-metallic element. In this way the air will drop in velocity as it drops in temperature and the registers won't be blasting 90 degree air at the occupants of the house.—*Kaustine Company, Inc., Perry, N. Y.*

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Easy Fabrication, Lifetime Permanence

Hussey *Pure* Copper has always had industry's recognition for uniformly high quality, easy workability and the ageless durability that only *pure* copper can give. Nothing serves like copper where the characteristics of copper are required. No finer material can serve your applications than HUSSEY COPPER and copper products.

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Equipment Developments.....

For your convenience in obtaining information regarding these items, use the coupon on page 157.

139—Combustion Chamber

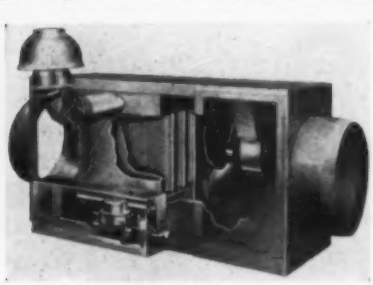
The Gregory stainless steel combustion chamber, containing a high chromium alloy and withstanding extreme temperature without distortion, is available.

Interlocking panels, 6½ by 14½ in., may be assembled to fit round, square or rectangular fireboxes. Mirror-like finish sheds carbon and soot.—*J. G. Gregory Company, Burner Div., 228 N. LaSalle St., Chicago.*

140—Southerner

The Southerner, a new fully automatic central heating system, handles natural, mixed, and manufactured or LP gas. The Southerner can be quickly installed without major alteration in the attic, closet or suspended from joists under floors with 18 to 20 in. clearance. Adjustable brackets are attached to the frame for easy installation.

Construction details include a slotted immersion burner which gives quiet combustion and uniform



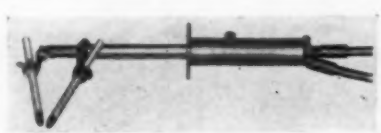
heat distribution; heavy gauge electrically welded steel combustion chamber which is assembled with cast iron headers; multiple flat tubes to assure ample heating surface, low surface temperatures; and a dynamically balanced propellor and resiliently mounted motor to provide dependable forced-air circulation. The unit is equipped with fan and limit control and meets AGA requirements.

The Southerner is suitable for small homes, summer cottages, service stations and offices.

Three models are available. The FU-30 is 13x16x29 in. and has 24,000 Btu. output. Models FU-60 and FA-60 with a 48,000 Btu. output are 13x16x37½ in. in size. A larger model will be available soon.—*Norman Products Company, 1150 Chesapeake Avenue, Columbus 12, Ohio.*

141—Arc Torch

Many welding and brazing operations for which a very soft flame is the most suitable source of heat can now be done by the double-carbon arc process. Current conducting members of the Phillips Arc Torch are two concentric metal tubes, one sliding easily within the other and insulated by a fiber sleeve, thus automatically maintaining align-

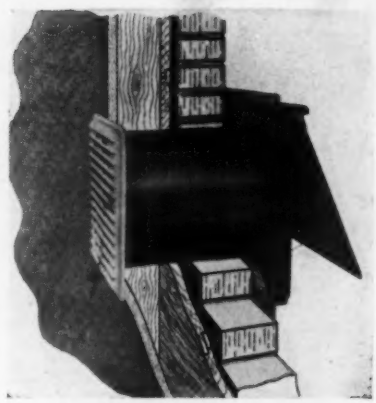


ment for all adjustments of arc gap width. A control button is located in the fiber handle. The torch can be used with all types of arc welding machines, AC or DC, and is furnished with both bayonet type and lug type terminal connectors. It will accommodate carbon electrodes from ¼ to ⅜-inch diameter without changing holders or using adaptors.—*C. E. Phillips & Company, 2750 Poplar St., Detroit 8.*

142—Oil Burners

The Winkler low-pressure oil conversion burners are designed to burn even the poorest oils over wide viscosities with maximum efficiency. Oil is metered and pre-mixed with low-pressure air to secure thorough atomization of the fuel before secondary air is added.

A newly developed nozzle sprays a mixture of oil and air in a uniform cone through orifices large enough to preclude clogging with dirt or foreign matter.—*U. S. Machine Corporation, Lebanon, Ind.*



143—Fasco Ventilator

A new Fasco ventilator—an exhaust-type—features a single automatic control, new high efficiency in air movement, and quick, easy installation and maintenance.

Highly efficient straight-line air movement of 405 cfm. is made possible by the design of fan, motor and telescoping tubular duct.

The standard Fasco ventilator fits walls from 5 to 9½ in. thick and up to 13⅞ in. with an extra sleeve. Additional sleeves are available for thicker walls.

The Fasco ventilator is powered by a long-lived shaded pole motor with self-aligning bearings and extra oil reservoir for a minimum of care. Standard unit voltage is 115V-60 cycle, a.c.

Grille, door and duct are constructed of steel. Door and duct are finished in a corrosion-resistant paint. Grille is finished in white, baked-on enamel.

Underwriters' Laboratories approval has been placed on the Fasco ventilator.—*F. A. Smith Manufacturing Co., Inc., 255 N. Union St., Rochester 7, N. Y.*

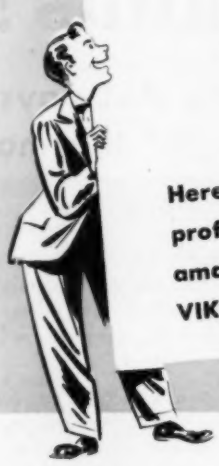
144—Screw Anchors

Sandscott plastic expanding anchors have been developed for use with wood or lag screws. A feature is the overlapping internal and external slits which give "concertina" expansion for dependable holding. Pull-out tests have been conducted at Pittsburgh Testing Laboratory. The maximum load pull was 2,965 lbs., using a No. 20 screw.

The anchors are made slightly larger in diameter than the hole size to be drilled. The concertina expansion feature compresses itself and the tough plastic enables it to be driven into a tight hole.

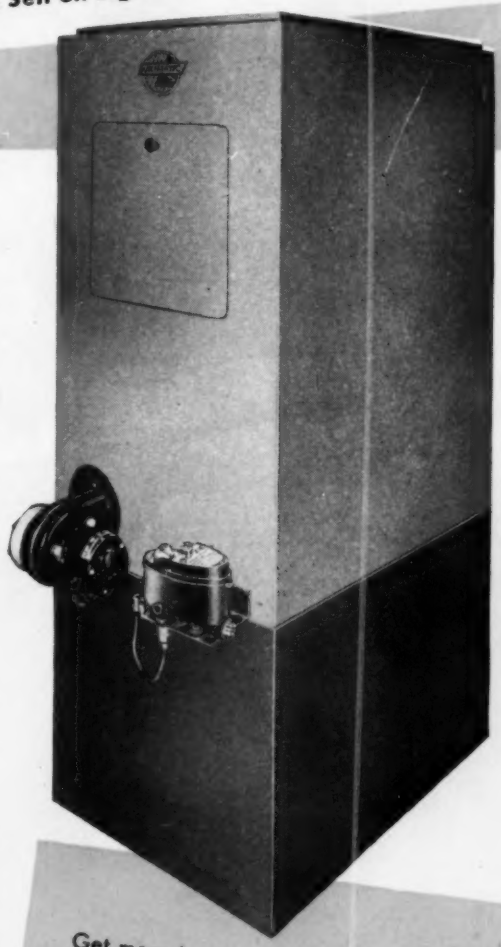
Seven popular sizes in various lengths to accommodate screws ranging from No. 5 to 20, or ¼-in. and 5/16-in. lag screws.—*Holub Industries, Inc., Sycamore, Ill.*

LOWER PRICES



LOWER COSTS, JUST WHEN YOU NEED THEM!

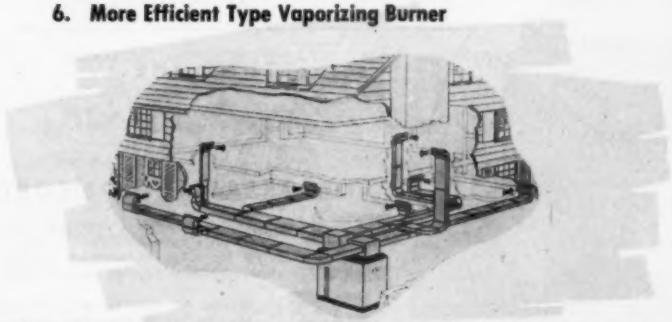
Here's a red-hot VIKIMATIC combination to reduce your costs and increase your profits . . . READY NOW, right at the beginning of your best Selling Season. The amazing new VIKIMATIC WINTER AIR CONDITIONER . . . the 1813 . . . and VIKIMATIC FLATPAK ALUMINUM DUCTWORK Sell on Sight!



A Winter Air Conditioner to feature this season, the new VIKIMATIC 1813 . . . gives you a real bidding advantage.

. . . Six REAL features for you to sell right now.

1. **Greater Capacity**
2. **More Heating Surface**
3. **Larger Warm Air Circulating Blower**
4. **Burner Blower supplies metered air for combustion with high or low fire**
5. **Patented Heat Flow Combustion Chamber**
6. **More Efficient Type Vaporizing Burner**



READY NOW—FLATPAK ALUMINUM DUCTWORK. To further reduce your costs and increase your profits . . . up to 15% . . . you will like VIKING'S new method of making, shipping and handling aluminum ductwork. All fittings are precision-made on dies at the factory and shipped knocked-down and nested. FLATPAK is easier to handle . . . takes less storage space . . . costs less to ship . . . is simple to assemble. FLATPAK is an efficient system of PREFORMED DUCTWORK . . . giving you more and better installations and at a greater profit than possible heretofore. See your VIKIMATIC Distributor for details.

Get more business with VIKIMATIC — Viking's complete line of Heating, Cooling and year-round air conditioning equipment, oil, gas or coal fired.

VIKIMATIC

THE

VIKING MFG. CORPORATION

1747 Chester Ave., Cleveland 14, Ohio

Does *mild weather* overheating bring you complaints?

for better heating ALLways install a *Magic Dial* thermosta

The Magic Dial Thermostat answers your customer's pro lem of overheating on mild Fall or Spring days. In mi weather, when shorter "on" periods of the burner are ge erally more desirable, the user himself can accurately reg late the running periods of the burner — to prevent "ov shooting" and assure more comfortable temperature throug out the house.

Users are not dependent upon a factory pre-set instal ment for temperature control, for the Magic Dial permits "tuning" of the heating plant to individual comfort pref ences, seasonal weather changes, and varied heating requi ments. No other thermostat offers this quick, simple, conve ient method for enjoying the full benefits of automatic he

You can't compete if your controls are obsolete! F year 'round customer satisfaction — install a modern Ma Dial Thermostat — the comfort control that has been co sistently pre-selected with other famous Perfex Twin Co tact controls to carry the trade names of the leading au matic heating manufacturers.

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TUNE THE *Magic Dial* FOR GREATEST COMFORT

1. The "A" position provides short burner operation periods . . . desirable for close temperature regulation, particularly during mild weather.
2. Moving toward "B" position lengthens the burner operation periods to adjust for characteristics of individual heating system.
3. Moving toward the "C" position further increases burner operation periods for better heat distribution to remote rooms.

PERFEX
TWIN CONTACT CONTROLS

MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLI

A COMPLETE LINE OF TWIN CONTACT CONTROLS FOR ALL TYPES OF HEATING

Profits Soar with this New *Magic Dial* clock thermostat merchandising program

- ★ Striking Counter or Window Display
- ★ Powerful Sales Letters for Your Letterhead
- ★ Salesmaking Envelope Stuffers or Handout Literature
- ★ Radio Spot Announcements
- ★ Telephone Canvasser

Here is a hard-hitting powerful merchandising program which will ring up added profits and build real customer satisfaction. It features a sales-getting counter display — and other effective sales helps which tell a graphic story of the world's finest clock thermostat—the *Magic Dial*. The *Magic Dial* Clock Thermostat practically sells itself — its rich white gold beauty, its exclusive operating advantages, its easily visible clock face . . . PLUS the fuel economy of automatically lowered night temperature — are sales advantages which mean true customer satisfaction. This program is available to you through your heating equipment manufacturer. Investigate today!

PERFEX CORPORATION, Milwaukee 7, Wis., Perfex Controls Ltd., Toronto 1, Ont.

WORLD'S FINEST CLOCK THERMOSTAT . . . the *Magic Dial*

PERFEX

TWIN CONTACT CONTROLS

MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES
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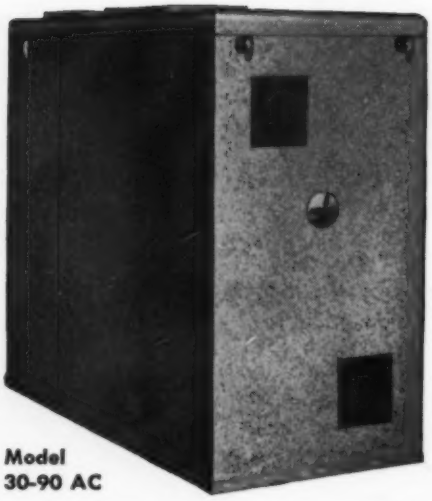
Ask YOUR HEATING EQUIPMENT MANUFACTURER ABOUT THIS PROFIT MAKING CAMPAIGN



Model
30-90 AC

UNLIMITED!

The New OIL-FIRED NiAGARA

Brings Winter Air Conditioning to City and Country Homes *ANYWHERE*

● Your installations of winter air conditioning furnaces are not limited by the locations of homes when you concentrate on Niagara heating equipment. With the new Niagara Model 30-90AC Oil-Fired unit you can supply modern winter air conditioning ANYWHERE.

Model 30-90AC is an efficient unit for low cost operation and many years of trouble-free service. The heat exchanger is of heavy boiler plate construction, with precast insulating ceramic combustion chamber. The pressure (gun type) burner, using lower priced No. 3 fuel oil, supplies 90,000 BTU per hour at registers, and is complete with fan switch, thermostat and protectorelay (intermittent). The blower is 11″, belt and pulley type. Standard equipment includes two 16x25x2″ air filters, barometric draft regulator, and cartridge-type (replaceable) oil filter. Cabinet dimensions: 52½″ high, 27¾″ wide, 56⅞″ long. Finish, chateau green Hammerloid enamel with painted inner linings.

The furnace can be supplied with or without the oil burner.

SQUARE AND ROUND COAL FURNACES CAST-IRON OR STEEL

Niagara Coal Furnaces are made in round and square types, with the famous Niagara cast-iron heat exchanger, and round and square models with steel combustion chambers.

Included in the complete Niagara line are gas-fired winter air conditioners and gravity furnaces for small, medium and large homes.

Write Today **for the complete story of Niagara furnaces—product of 55 years' experience in manufacturing residential heating equipment. When you install Niagara, you associate with Success.**

Coal-Fired Gravity
Cast Iron or Steel

NIAGARA FURNACE DIVISION • *The Forest City Foundries Company* • **2500 West 27th St.** • **Cleveland 13, Ohio**

OIL-COAL NiAGARA AND GAS

GRAVITY AND WINTER AIR CONDITIONING UNITS

Wheeling
CORRUGATING COMPANY
Reg. U.S. Pat. Off.

Back up good workmanship with WHEELING COP-R-LOY PRODUCTS

WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

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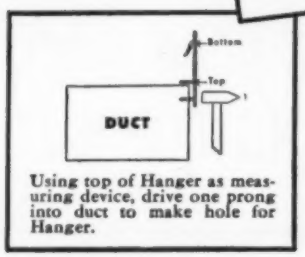
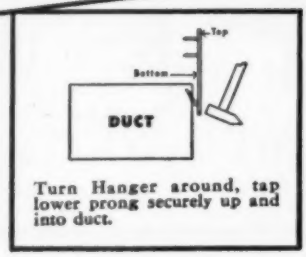
GET *Free Samples* OF HEXDALL DUCT HANGERS

U. S. PATENT
NO. 2264686

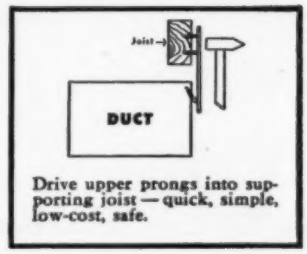
Simple as A. B. C.



Using top of Hanger as measuring device, drive one prong into duct to make hole for Hanger.



Turn Hanger around, tap lower prong securely up and into duct.



Drive upper prongs into supporting joist — quick, simple, low-cost, safe.

SPEED YOUR WORK..NO SPECIAL TOOLS
SAVE 92% ON LABOR!

Hang ducts like *"greased lightning"* . . . handle *more* jobs . . . handle each job *more profitably* . . . and *cut down on accidents* by using these revolutionary new Hexdall Duct Hangers. They're *cadmium-plated* for ease in handling, neater appearance and rust-resistance.

Tests prove *labor savings* up to 92% — you eliminate costs of lost and mislaid tools — you eliminate costs of worn-out tools — you eliminate costs of strip steel, nails, screws, bolts, rivets, and wire. *No special tools* required — just your pliers, screwdriver and hammer. And you eliminate *strain* on your men — minimize accidents.

Use Hexdall Hangers on *all types of duct material*—sheet metal, aluminum, asbestos, duct board, plywood, heavy paper, etc. . . . in all types of applications . . . in hitherto inaccessible spots . . . around all types of obstructions. The Hangers can be easily twisted to any desired shape for any particular job.

Let us prove to you, without obligation, that they are the world's biggest little time-and-money-savers!

SEE FOLLOWING PAGE FOR APPLICATION DRAWINGS

FREE SAMPLES

. . . for you to try on the job, will be mailed upon request. See for yourself how these tested, proved labor-savers speed work.

FREE! Shop Work Sheet

Send for Work Sheet for hanging in your shop.

It contains complete instructions and illustrations on the proper manner of using the Hanger.

EACH CARTON OF HANGERS HAS THE SHOP WORK SHEET ATTACHED TO IT.

No Sheet Metal Screws needed!
Use on Aluminum...or any kind of duct material!

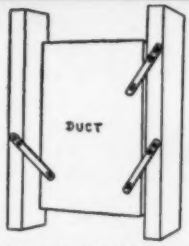
ORDER FROM YOUR JOBBER—If your favorite jobber has no stock as yet, send us his name and we'll see that your order is filled.

A. M. HEXDALL CO.
MORRIS, ILLINOIS
MANUFACTURERS OF SHEET METAL SPECIALTIES

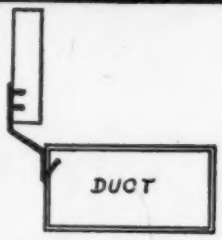
24 WAYS TO USE HEXDALL DUCT HANGERS!

(YOU'LL DISCOVER MANY OTHER APPLICATIONS ON THE JOB)

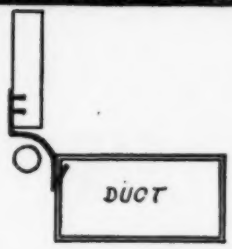
SEE PRECEDING PAGE FOR COMPLETE DESCRIPTION OF HEXDALL DUCT HANGERS



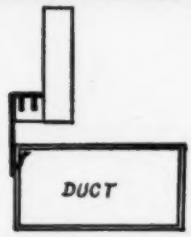
1 Use Hanger as shipped for fastening of stacks on gravity and forced air jobs.



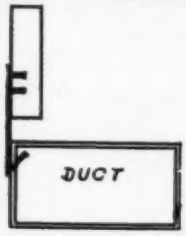
2 Offset, with two bends, supporting duct from joist.



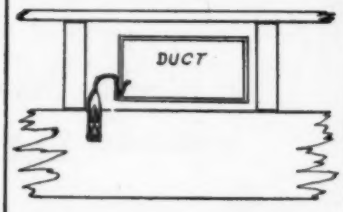
3 Offset bend, around a water pipe.



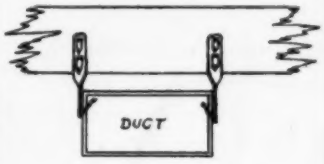
4 Angle bend, fastened to top of strip left by other mechanics.



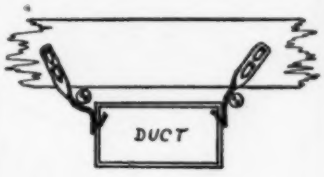
5 Simple application, using hanger as shipped to you.



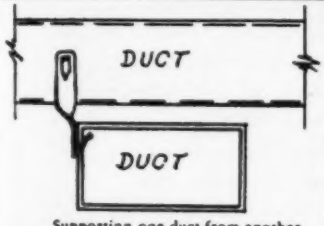
6 Bent to support overhead duct from timber below.



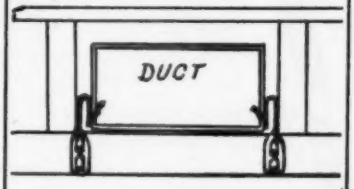
7 Most common type application—twisted to support duct from joist.



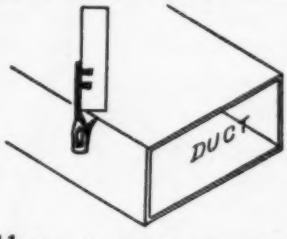
8 Hangers bent and twisted to allow for B-X.



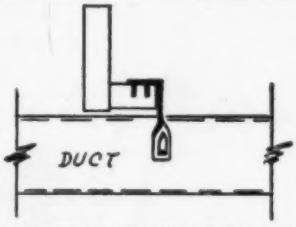
9 Supporting one duct from another. Only one of upper prongs is used, bent down at same angle as lower prong.



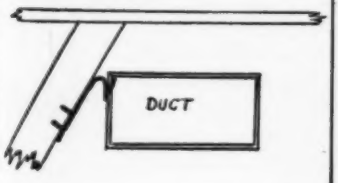
10 Hangers bent and twisted, for close quarter application. Hangers applied to duct before raising duct into place and fastening to timber.



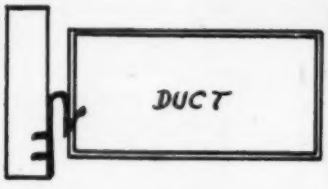
11 Twisted hanger, for fastening angling duct to joist.



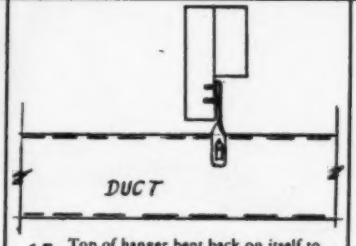
12 Angle bend and twist, fastened to top of strip left by other mechanics, or to bridging.



13 Hanger bent to fasten duct to slanting joist.

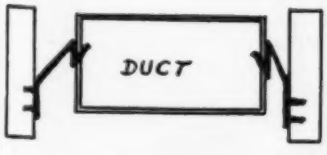


14 Close quarter application—pierce duct, drive hanger into joist, set duct in place on hanger and pull down on duct.

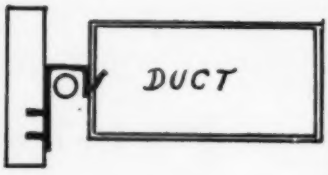


15 Top of hanger bent back on itself to avoid interference with obstruction above. Lower part of hanger twisted.

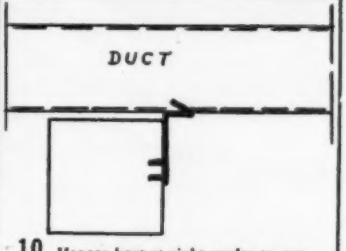
16 Close quarter application—drive bent hanger into joist, line up duct for determining point to be pierced, pierce duct, set duct in place on hanger and pull down on duct.



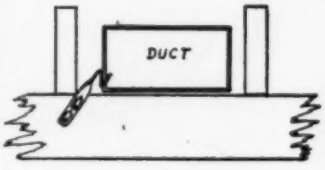
17 Double hangers in close quarters—pierce duct on both sides. Drive right hand hanger into joist, set duct into place and pull down on duct. Tap left hand hanger into pierced hole in duct, hammer in place on joist.



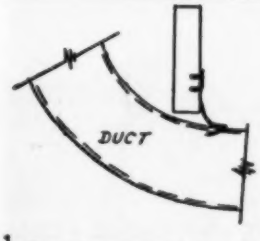
18 Hanger bent at two right angles to go around a pipe.



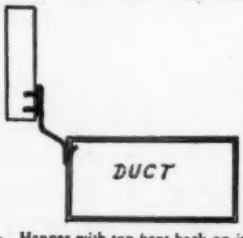
19 Hanger bent at right angles to support overhead duct from timber below.



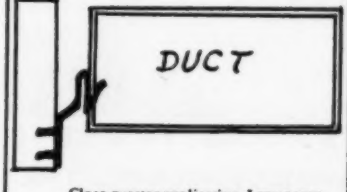
20 Hanger bent and twisted to support overhead duct from timber below.



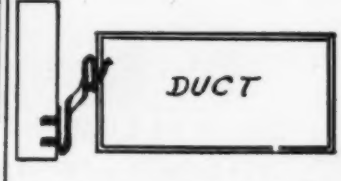
21 Hanger bent to support duct at bend in duct.



22 Hanger with top bent back on itself, lower part bent at angle to support duct from offset overhead joist.



23 Close quarter application. Lower part of hanger bent back on itself. Upper part bent at two angles. Pierce duct, set duct in place, insert hanger in pierced hole and hammer to joist.



24 Close quarter application, with duct offset from joist. Hanger bent back on itself at both top and bottom, twisted at center to angle required.

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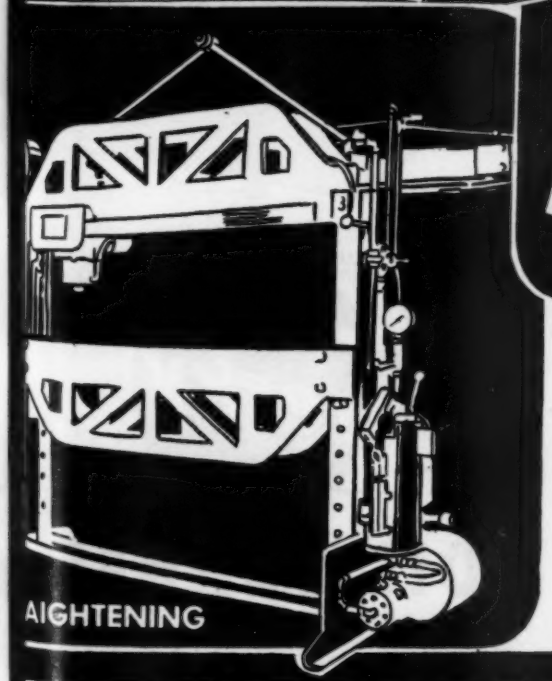

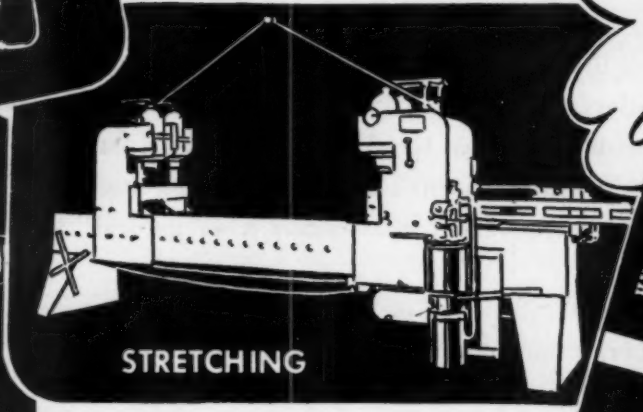

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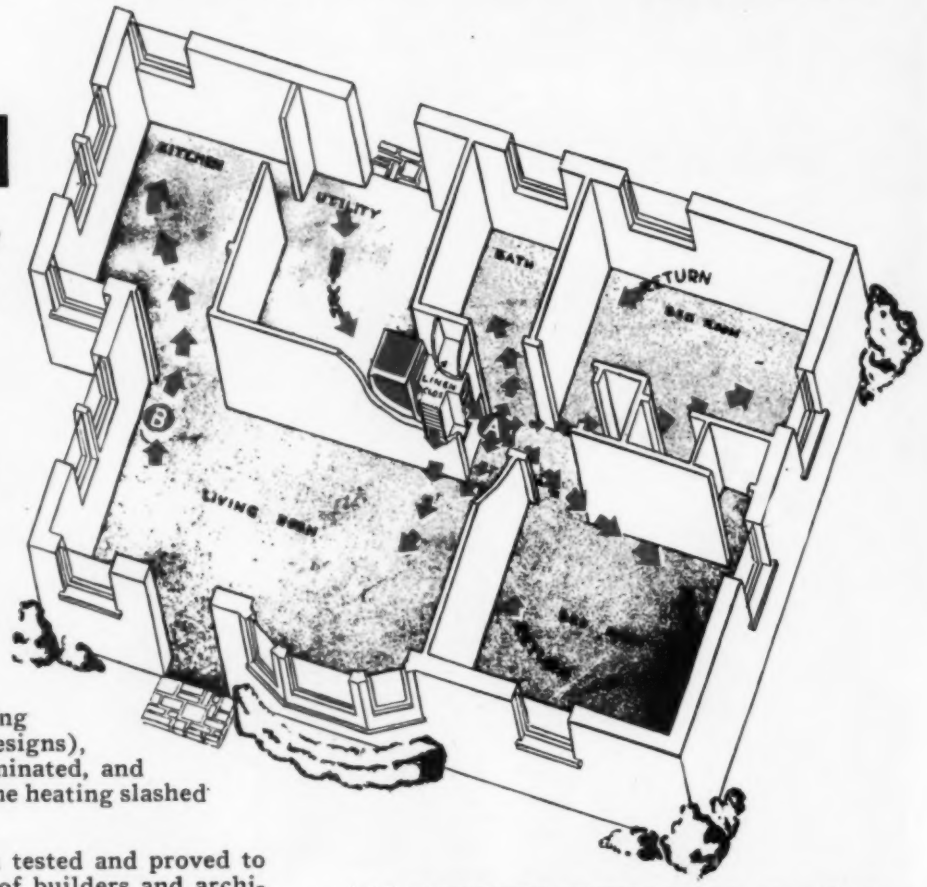
FREE-AIRE
CENTRAL HEATING SYSTEM



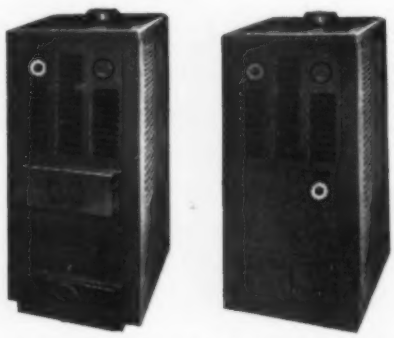
BETTER HEAT LOWER COST

KEHM FREE-AIRE is the simplest, most effective low cost heating system ever developed for small homes. Used with single, double or triple opening duct boot (write for Kehm designs), duct work is practically eliminated, and the cost of effective small home heating slashed to an all-time low.

Free-Aire Systems have been tested and proved to the satisfaction of hundreds of builders and architects and thousands of home owners over a period of eight years. Each Free-Aire System designed to our specifications is guaranteed to make all rooms comfortable on the coldest days.

Kehm Free-Aire, in FHA approved designs, can also be applied to basement one and two story homes.

ALL PURPOSE FURNACE. Heating Contractors! Here is the heater that can be installed as a stove for spot heating, as a pipeless furnace or with conventional gravity duct work. Also can be used for small furnace replacements. Write for our many design applications and prices.



Coal and Oil units now available. Coal unit is convertible to oil or gas—a desirable feature for the builder.

Compact, self-contained central heating unit occupies little floor space. The use of hallway and doors for circulation of air eliminates unnecessary duct work, and permits heat to flow along the floor eliminating unpleasant cold drafts.

A Normal use of doors leading off hallway admits adequate heat into Bedrooms and Bath. At night, bedroom doors are habitually shut, and act as valves closing off heat circulation. These rooms will heat quickly in the morning because of the large inlet area formed by door openings.

B Louvered or open doors permit full recirculation of air through living quarters, and work rooms to heater location, where it is picked up by the fan.

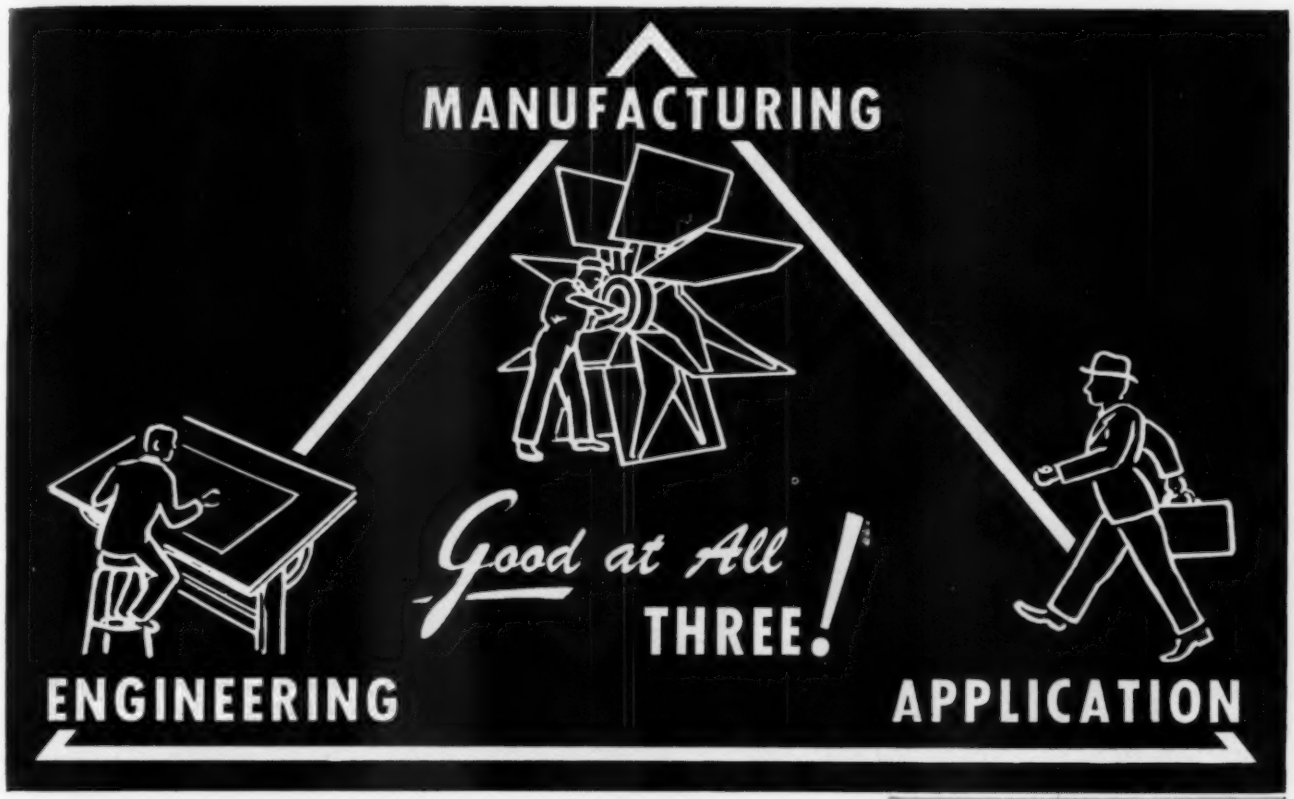
THE KEHM CORPORATION

135 South La Salle Street, Chicago 3, Illinois

"More than a Half Century in Heating"

Licensed under patent No. 2,278,843.

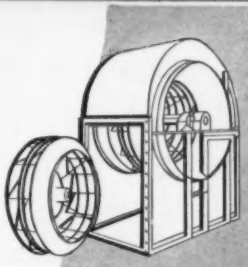
makes Warm Floors possible

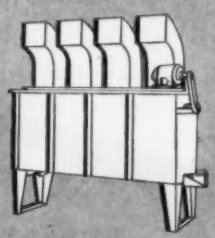


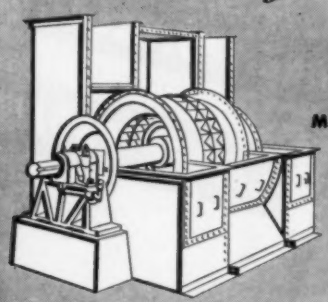
Take any type of air handling or conditioning requirement, and it makes sense to call in the nearest Clarage Application Engineer. This man KNOWS his business — can give you expert assistance.

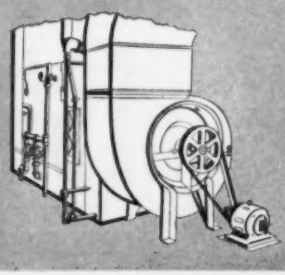
And back of his cooperation and recommendations are engineering resources and manufacturing skills unsurpassed in the fan industry. *Try Clarage for satisfactory results accomplished MORE economically.*

CLARAGE FAN COMPANY
Kalamazoo, Michigan
Application Engineering Offices in all Principal Cities


AIR FOR INDUSTRIAL PROCESSES

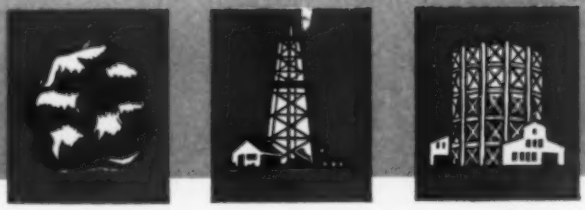

FACTORY AND SPACE HEATING


MECHANICAL DRAFT


INDUSTRIAL AIR CONDITIONING

Clarage
—HEADQUARTERS FOR AIR HANDLING AND CONDITIONING EQUIPMENT

HESS Radiant Heating Equipment is Best for ANY Fuel



Because of the superior heat transmitting surfaces of the Hess Furnace, it fulfills all heating requirements when used with any automatic oil burner, gas burner or coal stoker.

More than 74 years of experience in building quality heating equipment is your assurance that you are offering your customers America's leading furnaces designed to utilize the maximum radiant energy for any fuel, whether coal, oil or gas.

MAKE MORE SALES
MORE INSTALLATIONS
MORE PROFITS

DEALERS

Write or wire today for complete details on the Hess line of radiant heating equipment.

ON THE SQUARE RADIANT HEATING

HESS
Since 1873

WARMING & VENTILATING CO.
1211 So. Western Ave., Chicago 8, Ill.

Auer DURABILT

Floor Registers and Cold Air Faces

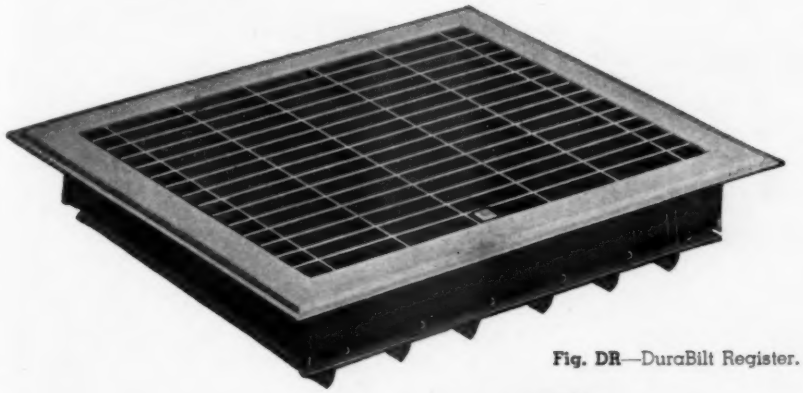


Fig. DR—DuraBilt Register.

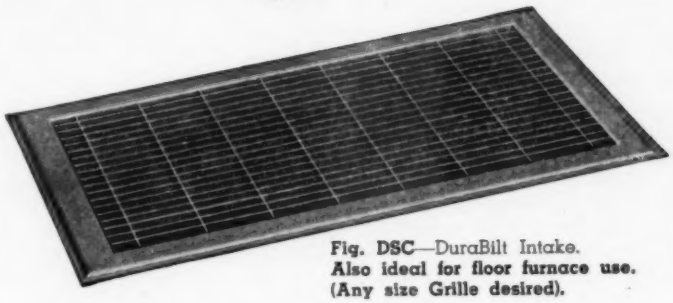
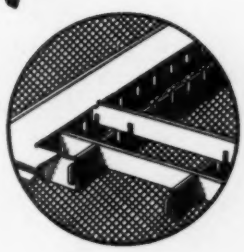


Fig. DSC—DuraBilt Intake.
Also ideal for floor furnace use.
(Any size Grille desired).



Cross-locked design

Precision workmanship marks this fine DuraBilt, which is cross-locked and clinched for SUPER STRENGTH. These registers and intakes are made with great accuracy and carefully assembled, with heavy flat steel, rolled-edge bars, mortised and interlocked at every cross-joint. The whole grille assembly is forced together on the press. and tenoned and locked tightly into welded, reinforced frame, resulting in an extra rigid and durable product. Free open area is about 81%.

Improved narrow mesh is used on all sizes. The 7/16″ by 1-15/16″ opening is heel-proof, excluding small objects such as chair legs, and helping to conceal register box interior. Note the special Auer exclusive patented spring tension valve adjustment, easy operating, non-slipping and positive. DuraBilt employs the best and simplest engineering design ever devised for this type of register. For structural strength far exceeding any demands of normal service, use DuraBilt Registers and Intakes — they cost *no more*.

Write for complete Auer Register Book illustrating and listing all types and models for both air conditioning and warm air systems. Special Grille Catalog also sent on request.

THE AUER REGISTER CO., 3608 Payne Ave., Cleveland 14, Ohio

Auer REGISTERS

& GRILLES for AIR CONDITIONING & GRAVITY

. . . a message for aggressive furnace dealers

The BOSTON BREESE BURNER

is ideally suited for warm air furnace conversions — a volume-builder and profit-maker. Write at once . . . . . BOSTON BREESE dealerships are open.

Illustration shows burner mounted on ash pit door frame of an old hand-fired furnace. Can also be installed in fire door without removing grates. We can supply, or the dealer can easily make the necessary plates, etc. Complete installation instructions are provided.

It's a well-known fact that literally hundreds of thousands of hand-fired coal installations are still operating and converting them to automatic oil firing is one of the most lucrative markets to develop for some time. To cash in on these great potentials, take on the new Boston Breese Burner and help your customers eliminate the dirt, expense, and toil of hand-firing. They will quickly see how inexpensively and efficiently this burner operates and their recommendations will be a big factor in building a goodly volume of new business for *you!*

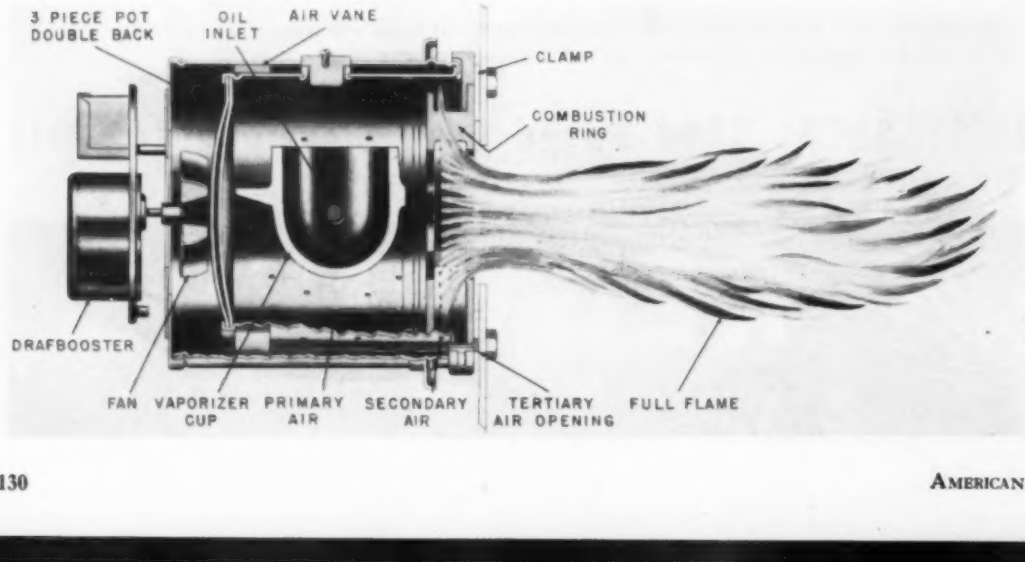
The Boston Breese Burner was developed for the Armed Forces, where it proved very successful, and is now being manufactured in three models for civilian use. It's quickly and easily installed, compact in design, and since all operating parts are *outside* the burner, they're not subject to excessive heat. The small, efficient shaded pole motor uses less current than an electric light bulb. Combustion efficiency is far above the average home heating burner, and since the Boston Breese Burner can be operated with a controlled flame it means a constant flow of warm, healthful, economical heat.

Get in the conversion market NOW, but get in RIGHT . . . sell the Boston Breese Burner for quick turnover and profits.

We're on the lookout for dealers and distributors and your inquiry will receive prompt attenion. Please write us NOW!

BOSTON MACHINE WORKS CO.

7-17 WILLOW ST. LYNN, MASS.



Sectional View Breese Horizontal Oil Burner Model D

"YOU PUT IN COPPER JUST IN TIME MR. JOHNSON"

Put an end to rust-clogged or leaking water pipes with Anaconda Copper Tubes. Easily and quickly installed by your plumbing contractor.

Solid brass hardware; durable and distinctive, will never rust . . . indoors or out. Don't be fooled by hardware that's only *plated* with brass.

ANOTHER winter's storms and the rust-weakened gutters would have caused Mr. Johnson considerable trouble and expense.

Fortunately, the new copper gutters and downspouts are going in before any serious damage has come to the house or grounds. Now the fall rains and the winter snow and sleet are no longer a threat, for copper will *never* rust.

If your gutters, downspouts and roof flashing need replacement, specify Anaconda Copper for long-run economy and peace-of-mind. In terms of service life, copper costs less than rustable metal. But consult your sheet metal contractor now, so that he may plan in advance to obtain 99.9% pure Anaconda Copper—long the standard of quality.

Write for free booklet,
"How to Protect Your Home Against Rust"

THE AMERICAN BRASS COMPANY

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IT'S GOT TO HELP YOU TOO!

This Anaconda aavertising, which is presented regularly to millions of readers of leading home magazines, must help you before it can help us.

You will like the way this message asks homeowners for *early planning* that gives you time to obtain the necessary materials. It's always a sound policy to line up your work in advance.

ANACONDA
from mine to consumer

Anaconda
COPPER and BRASS

THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD.,
New Toronto, Ont.

Job After Job Calls for Heating *and* Cooling . . .
GET THE CONTRACT FOR *Both*...WITH TRANE PRODUCTS

Job after job now calls for both heating and cooling. Since the functions are so closely allied, often being accomplished with much of the same equipment, heating and air conditioning *must* be considered together.

Architects, engineers, and owners prefer a minimum of contracts and responsibilities — so the contractor who can bid on the whole job has a much greater chance of getting it. The contractor who cannot bid on the whole job may likely lose it to one who can.

Heating and air conditioning are so closely related, from figuring the job through installing it, that it is only logical for the contractor to grow with the industry by combining heating and air conditioning. In this way, the contractor has peak business the year around, and is assured of a steadily increasing market in remodeling and modernization work, as well as in new construction. Just as the contractor needs both heating and air conditioning to make his service complete, the heating and air conditioning industries need additional contractors so that they can expand to meet the enormous demand.

Trane is the ideal source of supply for the independent contractor who combines heating and air conditioning. The complete Trane line includes every necessary product for entire heating and air conditioning systems — giving the contractor the undivided responsibility of *one* manufacturer. Trane field engineers in 85 field offices are constantly available for help and advice in any phase of heating and air conditioning.

TRANE

Manufacturing Engineers of Equipment for
HEATING AND AIR CONDITIONING

THE TRANE COMPANY, LA CROSSE, WISCONSIN • *Also* TRANE COMPANY OF CANADA, LTD., TORONTO, ONTARIO

Yessir... SEND FOR THIS BROADSIDE AND GET THE *FACTS* ABOUT ONE OF THE MOST SUCCESSFUL OIL BURNER OPERATIONS IN *AMERICA!*

SURE, it takes a good man to achieve success in the retail oil burner business. But it takes a good oil burner, too—preferably a different and better burner like the Williams Oil-O-Matic based on the Low Pressure Principle. And it takes wholehearted factory cooperation . . . wide-awake merchandising support . . . powerful and consistent consumer advertising. For proof that Oil-O-Matic offers all this and *more . . . check the facts and you'll find that*

IN TRENTON, N. J., EVERY 4th OIL BURNER IS AN OIL-O-MATIC

That's a record to shout about, because Trenton is a highly competitive oil burner city. Maybe you'd like to know how Jake does it . . . why I. F. "Jake" Jacobs is Trenton's biggest and most prosperous oil burner retailer . . . why his new aim is "every *3rd* oil burner in Trenton an Oil-O-Matic." If so, mail the coupon *today* for a copy of "Everything's 'JAKE' in Jersey"—a thought-provoking broadside that tells about one of the most successful oil burner operations in America. His record proves that "you can go places and do things with a Williams Oil-O-Matic franchise"!

OIL-O-MATIC

MAIL THIS COUPON TODAY!

WILLIAMS OIL-O-MATIC DIVISION
Eureka Williams Corporation, Bloomington, Ill.

Yes sir, we want to "go places" too. So send us a copy of "Everything's 'JAKE' in Jersey."

Name_____

Address_____

_____

WILLIAMS OIL-O-MATIC DIVISION, Eureka Williams Corporation, BLOOMINGTON, ILLINOIS

Schaefer BRUSHES

"BUY SCHAEFER----IT'S SAFER"

Performance tested, SCHAEFER Brushes offer longer wear, better service, greater value—with the *correct* brush for every industrial and domestic use.

SCHAEFER Flue and Boiler Brushes of SILVER BRITE Rustproof Wire

SCHAEFER'S special alloy "Silver Brite" rustproof spring steel wire has been developed for longer wear, more effective cleaning. It offers extra value, extra satisfaction in any brush.

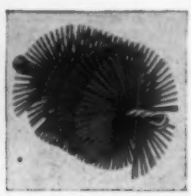
SCHAEFER
Rectangular Flue Brushes
No. S-415—2"x4"x4½"
No. S-416—3"x5"x4½"

SCHAEFER
Boiler Brushes
No. S-393—1¾"x4"x5½"
No. S-394—2½"x6"x6½"
No. S-395—3½"x6"x6½"

SCHAEFER
Boiler Brushes
No. S-390—1¾"x4"x4¼"
No. S-391—2¼"x6"x4½"
No. S-393—3½"x6⅝" x4½"

SCHAEFER
Boiler Brushes
No. S-399—2"x4"x6"
No. S-400—2½"x4½"x6"
No. S-401—3"x5"x6"

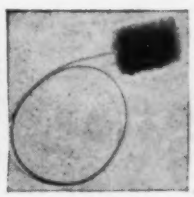
Single and Double Spiral Flue Brushes
No. S-432—Single Spiral —1" to 4" dia.
No. S-433—Double Spiral —1" to 4" dia.
No. S-434—For small Flues, ½" to 1" dia.



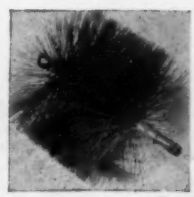
SCHAEFER Round Flue Brushes of Single Spiral, Flat Steel Wire
No. S-430—1" to 4" dia.

SCHAEFER Rectangular Flue Brushes of Flat Steel Wire—Spiral
No. S-420—2"x3¼"x6"
No. S-425—3¾"x6¾"x7"

SCHAEFER Furnace Brushes of Silver Brite Rustproof Steel
No. S-443—3", 4", 4½", 5" with 5 ft. handle.



SCHAEFER
Fibre Furnace Brushes
Selected Bassine fibre, flexible wire stem, 4", 5", 6" dia., 48" and 60" handle.
No. S-444-445

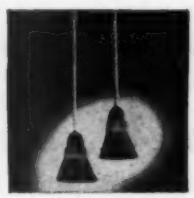


SCHAEFER Chimney Cleaning Brushes
No. 66—6", 7", 8", 10" and 12" dia. round style of Black Tempered Brush Wire.
No. 666—6", 7", 8", 10" and 12" dia. oblong style of Flat Tempered Steel Wire.

SCHAEFER
Wire Wheel Brushes
Solid Center Type of crimped steel wire.
No. 276—6" dia. x 1⅝" face.
No. 278—8" dia. x 1⅝" face.
No. 280—10" dia. x 2" face.

SCHAEFER
Handy Wire Brush
No. 816 — For roughing soldering, etc., 6" long, tempered steel wire trimmed 1¼".

Tin Handle Acid or Dope Brushes
Selected grade bristles in tin ferrule. Widths, ⅝", ½", ⅝".



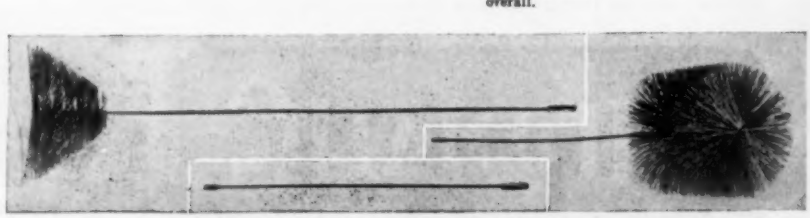
T. W. Flat Acid Brushes
Tinners soldering brush, horsehair filling, 1¼" width, 7½" overall. Twisted wire handle.

Radiator or Condenser Tube Brushes
Twisted in wire handle, selected hair or bristle. Wide range of sizes.
No. 10—⅝" dia. x 2" brush x 6½" overall.
No. 11—½" dia. x 3" brush x 8½" overall.

SCHAEFER Curved Handle Wire Brushes
No. 810—Oil tempered steel wire, trimmed 1¼", hardwood block, 14" long. Brush 6", 2, 3 or 4 rows.

SCHAEFER Shoe Handle Wire Brushes
No. 812—Oil tempered rustproof wire, 5" brush, 2, 3, 4 rows. Trim 1¼", overall 10".

SCHAEFER Straight Back Wire Brushes
No. 800-11—Oil tempered steel wire. Hardwood block, 7⅛" x 2¼". Wire trim, 1⅝", 6 x 19 rows.

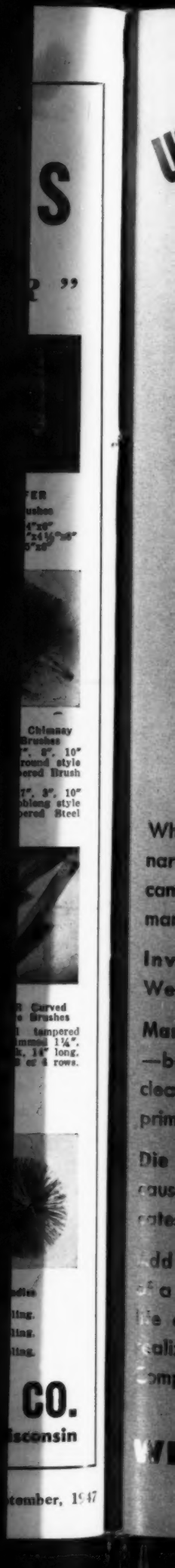


SCHAEFER Vacuum Cleaner Brushes
No. 1005—Bassine Fibre Brush, 10½" dia. tapered to 3" dia. x 6 ft. long—48" handle with threaded nipple at end.
No. 1000—Bassine Fibre Brush, 10½" dia. brush x 10" long. Handle 39" with threaded nipple at end.

Wire Flue Brush and Extension-Handles
4 ft. Handles with Nipple and Coupling.
5 ft. Handles with Nipple and Coupling.
6 ft. Handles with Nipple and Coupling.

Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

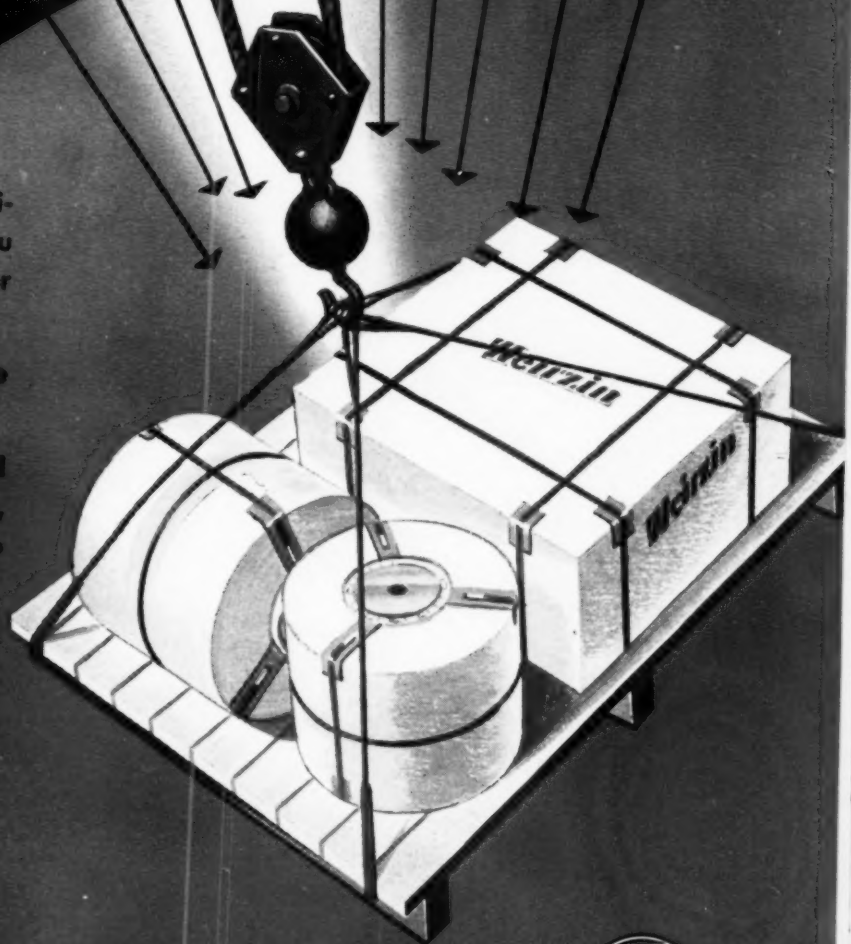
SCHAEFER BRUSH MFG. CO.
1025 South Second Street Milwaukee 4, Wisconsin



your manufacturing costs- GOING DOWN

Weirzin

Electrolytic Zinc-Coated Sheets and Strip



When Weirzin takes the place of ordinary sheets and strip in your plant, you can count on important savings in your manufacturing costs.

Inventory losses are cut—because Weirzin will not corrode in storage.

Many finishing operations are eliminated—because Weirzin requires no pickling, cleaning or buffing before fabrication, no prime coat before painting.

Die maintenance costs are reduced—because Weirzin's tight zinc coating lubricates dies without danger of zinc deposits.

Add to these economies the advantages of a better-finished product, protected for life against underfilm corrosion, and you realize what Weirzin can do for you. Complete information on request.

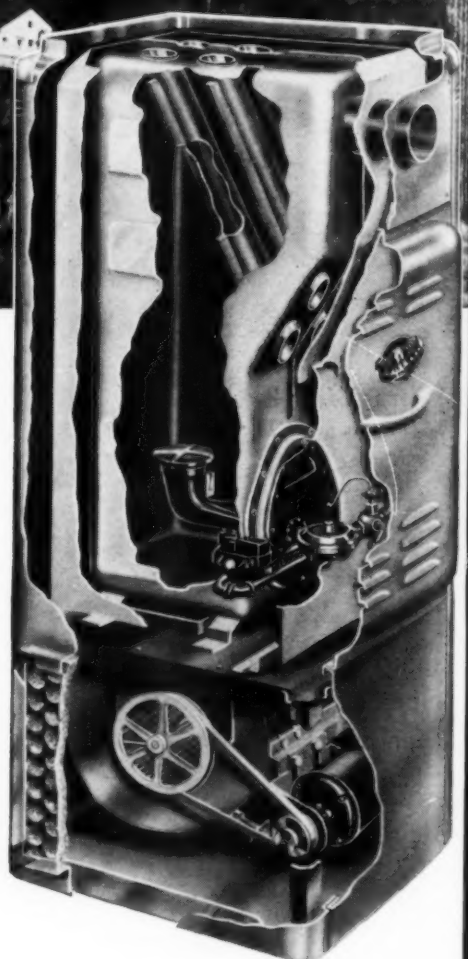
WEIRTON STEEL CO. WEIRTON, W. Va. *Sales Offices in Principal Cities*

Division of NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

WEIRTON STEEL COMPANY

MIRACLE *in Peoria*

A HOUSING REALITY--
NOT A HOUSING PLAN!



HUNDREDS OF MOR-SUN U-4-G GAS-FIRED FORCED AIR FURNACES SUPPLY HUNDREDS OF G. I. HOMES WITH YEAR ROUND INDOOR COMFORT!

Hundreds of G.I. families are living in prefabs* in Peoria—and every one is equipped with a MOR-SUN Heating System!

And what a system! With a house heat loss of 45,000 BTU's, the MOR-SUN packaged gas-fired forced air furnace — with an output of 58,000 BTU's — in a centrally located service room — took only three hours of two men's time** to install (including the runs to the various rooms)!

Each of these hundreds of G.I. families has more than a heating plant—each has a MOR-SUN U-4-G*** that supplies year-round indoor comfort!

You Get MORE with a MOR-SUN!

General Contractors — Best Construction Co., Peoria

***Heating Contractors — Lee Wagener Co., Peoria*

****MOR-SUN Midwest Sales Representative — F. C. Evans, St. Louis*

MOR-SUN

MORRISON STEEL PRODUCTS, INC., BUFFALO 7, N. Y.

"The Sun Never Sets with MOR-SUN"

HOTSTREAM *Draft-O-Stat*

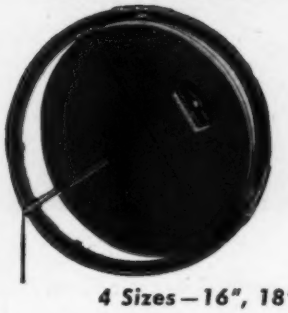
THERE'S A DRAFT-O-STAT FOR EVERY REQUIREMENT

Model "A" DOMESTIC

The original Draft-O-Stat for automatic control of chimney draft in furnaces and boilers. Selected as standard by leading furnace and boiler manufacturers. Adjustable counterweight on flutter for precision control of draft. Available with or without thimble.

9 Sizes—7" to 20"

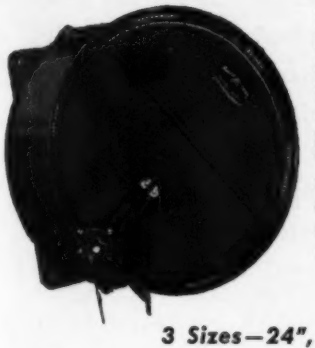
COMMERCIAL DRAFT-O-STAT



For use in apartment buildings, hotels, schools, small factories or office buildings. Can be used on natural draft or motor driven oil burners, hand-fired boilers, stokers and forced draft installations. Available with or without hand control.

4 Sizes—16", 18", 20" and 24"

INDUSTRIAL DRAFT-O-STAT



Sturdily constructed heavy-duty draft control for large heating plants. Available with or without breeching plate and thimble, and with or without locking device. Pays for itself on most installations out of one year's fuel savings.

3 Sizes—24", 30" and 36"

A 48 page Draft-O-Stat Manual, giving the complete story on barometric draft control, is yours for the asking.

Model "B"

DOMESTIC DRAFT-O-STAT—*New Design*

The new Model "B" Draft-O-Stat is the logical development of Hotstream Pioneering in draft control engineering. It represents the newest achievement in precision combustion control for the small heating plant. By barometric control of draft through adjustable, counterweighted flutter, it saves fuel, reduces smoke and soot, and improves operation of any furnace. Available in 2 sizes, to fit flue pipes from 6" to 9". Also available is the Model "BM" Motorized Draft Control for domestic installations.

HOTSTREAM AUTOMATIC DRAFT REGULATOR

Model "CST" Automatic Draft Regulator is designed for use with fuel-oil burning water heaters, kerosene and gas water heaters, range burners and warm air circulating furnaces. Dual valve arrangement controls excessive stack drafts, also eliminating the possibility of down drafts which might blow out the fire. Available in 3", 4" and 5" sizes, in galvanized, black iron or aluminum.

Model "CST"

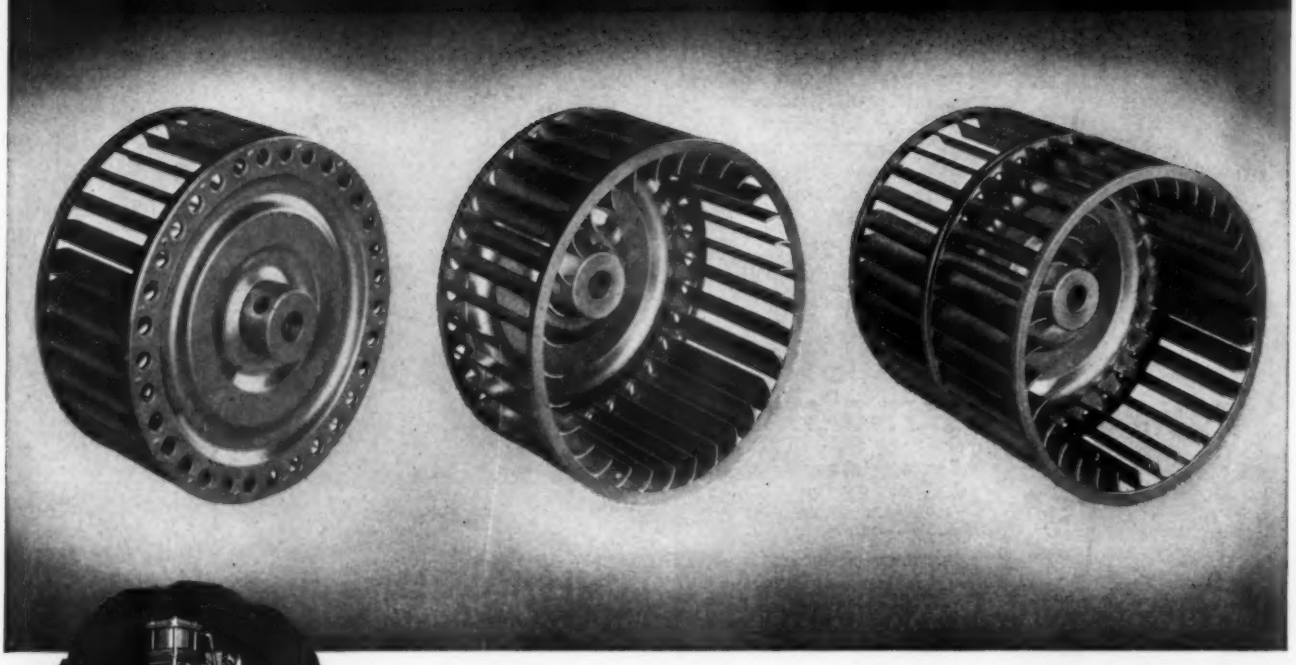
FUEL SAVING IS MORE IMPORTANT THAN EVER
This means increased sales and profits for dealers handling Draft-O-Stat.

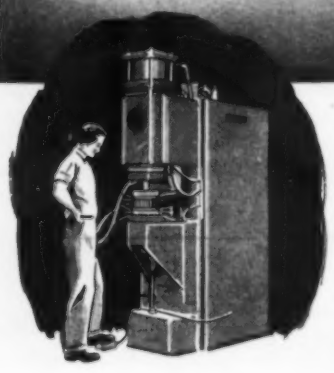
THE HOTSTREAM HEATER CO.
6923 QUINCY AVE. • CLEVELAND 4, OHIO

Manufacturers of a complete line of gas-fired, electric, oil-burning and bottled-gas water heaters, and draft controls

Newest development in BLOWER WHEELS

for oil burner, stoker, and air conditioning applications





The New Lau "WELDWHEEL" is the result of several years of concentrated engineering to produce a better performing, competitive-priced product. Its parts are welded together by electrical control and with greatest precision possible so that the proper amount of heat and correct pressure are developed to produce a strong, sturdy wheel to fit your exacting requirements. Its better performance gives you wider range of operation and better pressure characteristics. Furnished with standard hub or with hubs adaptable to Lovejoy or Guardian couplings. Standard hub bores ½-inch and ⅝-inch. Wheel width (or length) 1-inch up to 4-inches in single inlet. This wheel is available for immediate delivery in 5-inch, 6¼-inch and 7½-inch diameters.

Write for prices and further information.

THE LAU BLOWER COMPANY

Dayton 7, Ohio, U. S. A.

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS

Engineers and fabricators of general Air Handling Equipment • Blower Assemblies • Blower Wheels • Propeller Fans • Accessories

STOP YOUR CUSTOMERS FROM WASTING OIL!

SAVE ON FUEL AND CONSTRUCTION— ECONOMIZE WITH THE

BREESE

HORIZONTAL BURNER

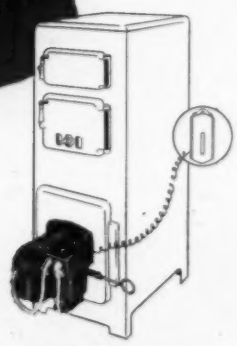
THE PROPER CAPACITY FOR EVERY REQUIREMENT ⅔ gal. per hr. for 60-70,000 BTU/HR. output 1.0 gal. per hr. for 100-110,000 BTU/HR. output.

MANUFACTURERS Use as original equipment, readily adaptable to present designs.

DISTRIBUTORS AND DEALERS— Use for conversion, easily installed, minimum cost.

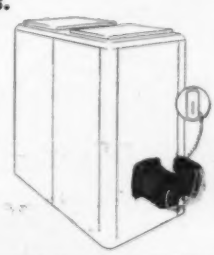
Write today for descriptive literature and technical data. Our engineering service is available on all BREESE *Burner Applications.*

THE BURNER FOR ALL HEATING PURPOSES



Heating Boiler Oil-Fired by Breese

Gravity Furnace Oil-Fired by Breese



Forced-Air Furnace Oil-Fired by Breese

MANUALLY CONTROLLED MODELS AVAILABLE FOR RANGES AND SIMILAR APPLICATIONS

BREESE BURNERS inc.

FORMERLY OIL DEVICES

341 EAST OHIO STREET CHICAGO 11, ILL. DEPT. A

RESEARCH AND ENGINEERING
SANTA FE, NEW MEXICO

With men who know trucks—THEY CARRY THE WEIGHT!

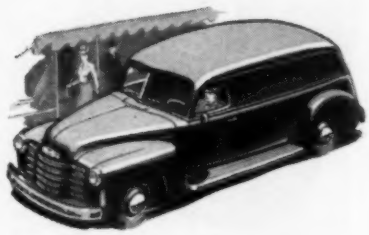
CHEVROLET *Advance-Design* TRUCKS

With experienced truck users, Chevrolet's new line of ADVANCE-DESIGN trucks definitely *carries the weight*—by preference and pounds! They're new . . . they're ahead of the times with *Advance Design* and the cab that "breathes"—that almost literally "inhales" fresh air and "exhales" used air.* Here's profit-power and performance, plus new features and innovations well worth seeing—well worth owning!

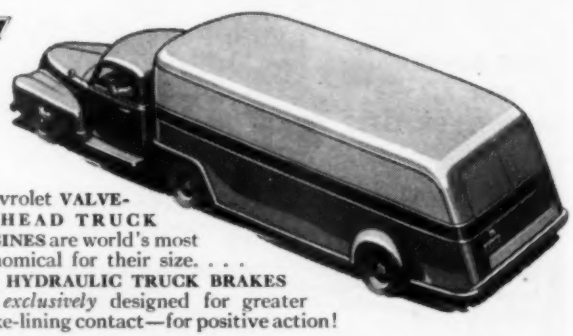
THE CAB THAT "BREATHES"—fresh air is *drawn in* from the outside—heated in cold weather—and used air is *forced out!*

The cab is **FLEXI-MOUNTED**—cushioned on rubber against road shocks, torsion and vibration! . . . **DRIVER'S COMPARTMENT** is wider, with more leg room. The seats are fully adjustable, bigger and more comfortable. Wider, deeper **WINDSHIELD** and **WINDOWS** increase visibility by 22%!

Panels and pick-ups have **INCREASED LOAD SPACE**—stake and high rack bodies **MORE EFFICIENT LOADING**. . . . New, stronger, sturdier **FRAMES** are designed to carry greater loads greater distances for a longer time!



LONGER WHEEL-BASES give better load distribution. . . . Chevrolet's famous **FULL-FLOATING HYPOID REAR AXLES** are geared for the load!



Chevrolet **VALVE-IN-HEAD TRUCK ENGINES** are world's most economical for their size. . . . The **HYDRAULIC TRUCK BRAKES** are *exclusively* designed for greater brake-lining contact—for positive action!

**Fresh-air heating and ventilating system optional at extra cost.*

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

General FUEL OIL FILTERS

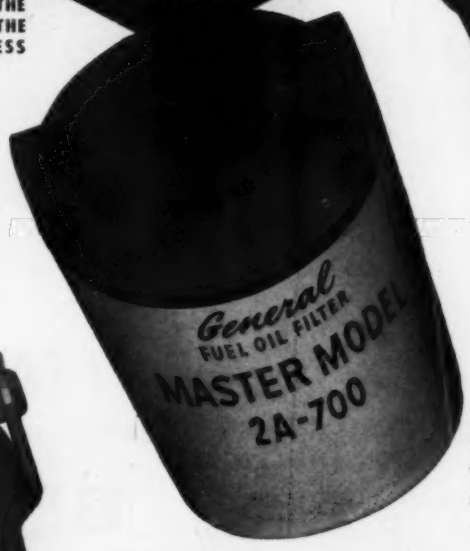
THE HOTTEST ITEM IN THE FUEL OIL BUSINESS

GENERAL FILTER IS THE 5-STAR LEADER IN THE FUEL OIL BUSINESS

STANDARD MODEL 1A-25
IDEAL FOR SMALL HOMES, SPACE HEATERS AND HOT WATER HEATERS

*Model 1A-25
4¾" High—3½" Dia.
Filter Unit Surface 31 Sq. In.
⅜" Pipe Openings

MASTER MODEL 2A-700
ADEQUATE CAPACITY FOR AVERAGE SIZE AND LARGE HOMES



Model 2A-700
6¼" High—4-5/16" Dia.
Filter Unit Surface 72 Sq. In.
⅜" Pipe Openings

DELUXE MODEL 2A-300
JUMBO SIZE FOR LARGE SYSTEMS AND DIRTY TANKS

*Model 2A-300
9-1/16" High—5½" Dia.
Filter Size 63 Cu. In.
⅜" Pipe Openings

WHEREVER FUEL OIL IS USED INSTALL A *General*

Service companies from coast to coast are proving that General Fuel Oil Filters are the most needed and outstanding accessory ever offered in the fuel oil burner field. Every installation is a proven profit maker. Every installation means added, periodic revenue through cartridge replacements. Service companies and contractors further add that they save thousands of dollars each year by avoiding troublesome call-backs caused by clogged nozzles.

Not all the benefit and profit is on the contractor's side — the customer gets cleaner burning fuel and is not inconvenienced by shut-downs caused by clogged burners. These facts make General Filters easy to sell and easy to increase profits — a good reason to *install a General wherever fuel oil is used!*

***LISTED UNDER RE-EXAMINATION SERVICE OF UNDERWRITERS' LABORATORIES**

GENERAL FILTERS INCORPORATED **GENERAL FUEL OIL FILTER** 12890 WESTWOOD AVE. DETROIT 23, MICHIGAN

CANADIAN FACTORY BRANCH: GENERAL FILTERS CANADA, 173 STRACHAN AVE. • TORONTO 10, ONTARIO

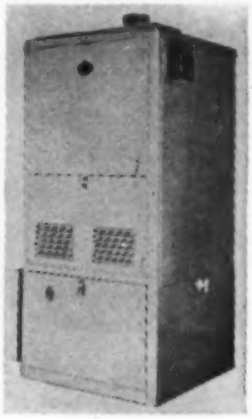
FACTORY REPRESENTATIVES: WILLIAM B. FORREST, Detroit, Mich.; WILLIAM J. DEBLER & SONS, Newark, N. J., Philadelphia, Pa., Brookline, Mass.; V. B. KATHE, Vancouver, Wash.; W. V. NUTTALL COMPANY, Salt Lake City, Utah; B. E. HOWENSTEIN, St. Louis, Mo.; L. E. SCHULEIN COMPANY, Chicago, Illinois; GRANSE CORPORATION, St. Paul, Minn.; RICHARD BARTHELMESS SALES COMPANY, Jacksonville, Fla.; T. C. FRENCH COMPANY, Akron, Ohio; A. G. ALLEN COMPANY, Indianapolis, Ind.; JEFF A. HEDDEN COMPANY, Atlanta, Georgia.

COR-O-AIRE . . . . *announces*

★ NEW
★ DIRECT
★ SALES POLICY
★ TO THE HEATING TRADE

(SEE ARTICLE IN THIS ISSUE)

THREE FAMOUS FURNACES for ALL GASES!



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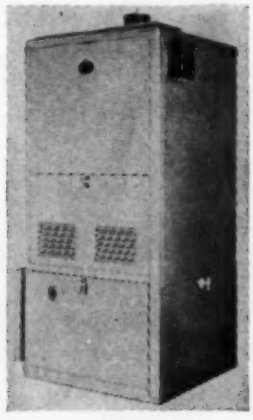


3

THE FINEST IN HEATING EQUIPMENT

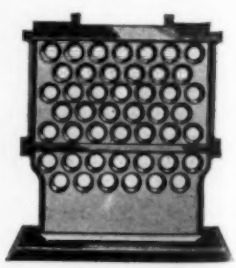
Remarkable Quality . . . . Performance . . . . and Amazing Economy

1 The 85SHB Hi-Boy gas-fired furnace and winter air conditioner . . . of 85,000 B. T. U. input rating . . . is shipped complete with fully automatic controls, Fiberglas filter and float control humidifier. Of beautiful blue Hammerloid finish, this modern and sturdily built Hi-Boy is ideal for replacement of obsolete equipment and for new homes.

2 The 85D Low-Boy—*newest sensation* in the heating industry is designed to meet demand for this type furnace and winter air conditioner at prices competitive to ordinary gravity furnaces. Input rating is 85,000 B. T. U. This unit will serve the quantity volume housing projects.

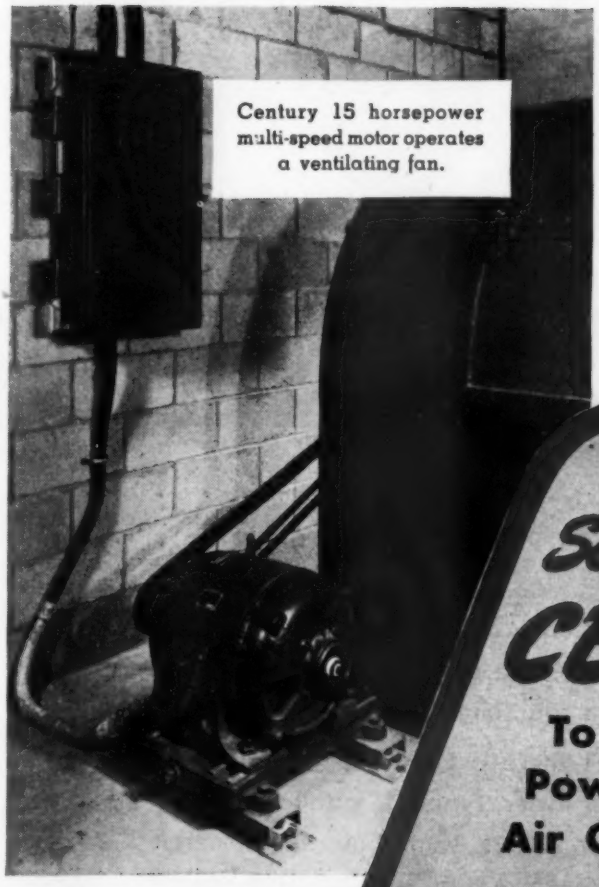
3 The 70SHB Hi-Boy of 75,000 B. T. U. with virtually same construction and marvelous performance as the 85SHB . . . is perfect for the popular home today and tomorrow.

ALL COROAIRES ARE IDENTIFIED BY VENTURI TUBE HEAT EXCHANGER (CAST IRON). PATENTED AND EXCLUSIVE FEATURE FOUND IN NO OTHER HEATING EQUIPMENT.



THE COROAIRE HEATER CORPORATION

1422 EUCLID AVENUE • • CLEVELAND 15, OHIO



Century 15 horsepower multi-speed motor operates a ventilating fan.

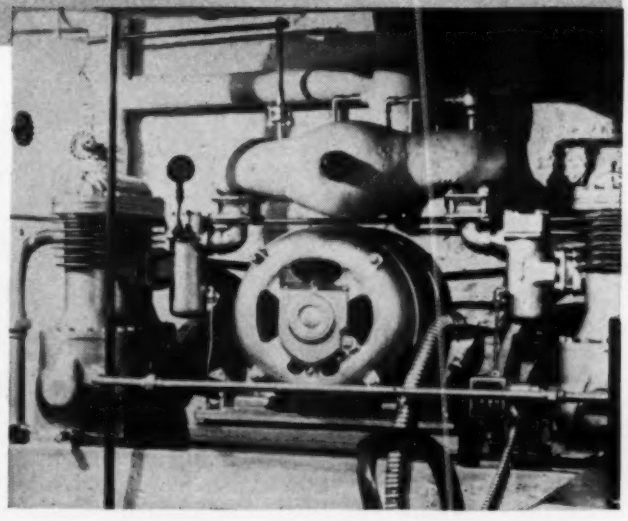
Select the Right Type of CENTURY MOTOR

To Furnish Quiet, Dependable Power for Comfortable Air Conditioning . . .

The wide range of Century motors includes alternating current, single phase, polyphase and direct current motors for compressors, pumps, fans, blowers, and unit heaters.

Century air conditioning motors are widely known for their ability to start quietly and run smoothly and quietly, and for their unusual freedom from vibration.

These advantages are the result of careful design and precision manufacturing. The dependable line of Century motors includes a wide range of torque characteristics to match the widely different load requirements of air conditioning equipment.



Century 20 horsepower motor drives a refrigeration compressor.

Many manufacturers have standardized on Century motors to assure their customers that they get smooth quiet motor operation throughout a long motor life.

Century builds a complete line of fractional and integral horsepower electric motors in the popular sizes to meet the needs of industrial production, commercial and appliance needs.

Specify Century motors for all your electric power requirements.

Century C MOTORS

CENTURY ELECTRIC COMPANY • 1806 Pine Street, St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

555

CONCO *Means ...*

The COMPLETE Line

Yes, the Conco heating equipment dealer enjoys good business and rich profit because his Conco line is truly complete!

COMPLETE! The Conco line includes equipment especially designed to give trouble-free performance with coal, oil or gas.

COMPLETE! There is Conco heating equipment for every type of installation—oil burners, stokers, winter air conditioners, gravity furnaces and water heaters.

COMPLETE! The Conco line combines every modern engineering feature offering efficiency and dependability with satisfying, streamlined beauty.

Conco dealers profit because Conco's complete packaged-heat units come all ready for fast, easy installation. In addition they gain customer good will because Conco equipment gives complete, lasting heating satisfaction.

CONCO *heat*

CONCO ENGINEERING WORKS
MENDOTA, ILLINOIS

BARBER-COLMAN

B-C

Line-O-Flo

CEILING OUTLETS

Keyed to Modern Architectural Concepts.....

A Vital Contribution to Continuity of Design.....

Available for Prompt Delivery

Model "LS" LINE-O-FLO, the basic unit, made in 3 styles to accommodate any installation arrangement

A NEW APPROACH TO AIR DISTRIBUTION

LINE-O-FLO air distribution outlets can be used singly, or end-to-end in continuous strips. Units are constructed of scientifically-designed, rolled-steel members, with orifices simulating Venturi throats having carefully-engineered bell mouth approaches.

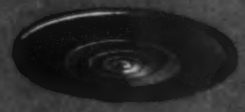
Model "LL" LINE-O-FLO, designed to receive Model M21118 DAY-BRITE lighting unit (made by Day-Brite Lighting, Inc., St. Louis).

This outlet has high diffusion efficiency. Room air is rapidly induced into the primary air stream to quickly equalize the temperature differential. Write today for a copy of Bulletin F-2741 giving descriptive and engineering data. Your Barber-Colman representative can show you a sample unit and discuss details.

BARBER-COLMAN COMPANY

1226 ROCK STREET • ROCKFORD, ILLINOIS

ANEMOSTAT...



a name you can proudly add to yours

Anemostat is an air-conditioning name which every architect, engineer or contractor can proudly associate with his own. For Anemostat air-diffusion successfully completes the actual purpose of air-conditioning — *true* air-comfort . . . and does it with a beauty of functional design that reflects the high reputation of the device.

Cooled or heated air blown through outmoded grilles or placques, usually does not result in successful air-conditioning. Instead, such air-distribution results in erratic air currents and drafts which bring about discomfort — if not, indeed, unhealthful conditions.

The patented Anemostat (readily installed in any existing or contemplated air-conditioning system) is a scientifically designed air-diffuser. It *thoroughly changes* and *evenly distributes* conditioned air. It prevents drafts, stratification, dead air pockets. It closely equalizes room temperature and relative humidity. It handles any duct air-velocity and permits a greater temperature differential between supply air and that of the room. Hence, it permits the use of smaller ducts and simplifies duct layouts — which lowers installation and operating costs.

In short, Anemostat fully meets the five air-conditioning tests which you must of necessity apply — Comfort, Health, Fine Appearance, Long Life, Trouble-Free Operation. Yes, *Anemostat is a name you can proudly add to yours!*

Include Anemostat air-diffusion in all of your future air-conditioning plans — you'll be proud of the results! Complete details gladly sent on request — and there's no obligation.

"NO AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR DISTRIBUTION"

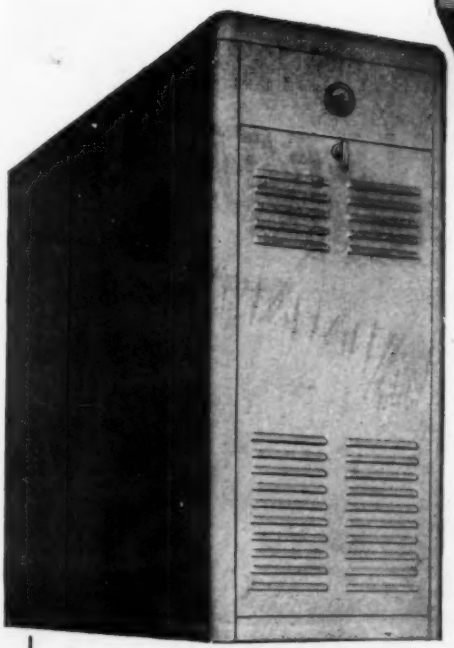
ANEMOSTAT

REG. U. S. PAT. OFF.

ANEMOSTAT CORPORATION OF AMERICA

10 East 39th Street, New York 16, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES



GREATER *Sales* AND *Profits*

THROUGH FULL REPRESENTATION IN THIS QUALITY LINE OF

WARM AIR HEATING EQUIPMENT

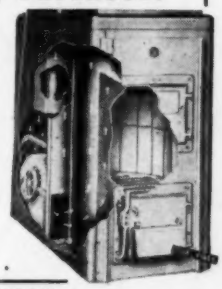
Certified

ORDER THESE UNITS *NOW!*

COUNTERFLOW

GAS, OIL, & COAL FORCED AIR UNITS

A compact, double bodied, forced air heating unit designed to provide greater fire travel over increased heat absorbing surfaces. Completely enclosed in attractive enameled casing are combustion chamber, heat saver, blower, motor, filter, humidifier, controls and burner. An ideal winter Air Conditioning Unit for home or building installation.



PERMAWELD CONSTRUCTION, applied to all Certified furnaces means an all steel body, electric arc-welded into one complete and durable unit. Through Permaweld construction gas leakage is overcome and installations made simpler.

WATCH OUR ADS FOR ANNOUNCEMENT OF NEW UNIT COMING SOON!

R-G GRAVITY FURNACE

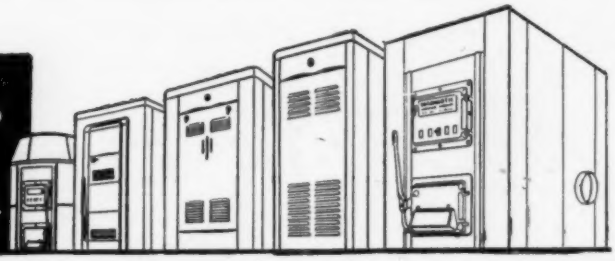
Certified all steel round gravity type furnaces are now available for immediate shipment. This popular model is built in sizes from 22 in. to 36 in. For full details on this R-G model, write for Bulletin 1144-C.

SEE YOUR JOBBER FOR COMPLETE DETAILS ON CERTIFIED EQUIPMENT

CERTIFIED FURNACE CO.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

1000 BERRY AVE. ST. PAUL 4, MINN.



HIGH EFFICIENCY IN HEAT TRANSFER . . .

AEROFIN

Conserve space — fuel — power with Aerofin fin-type coils. Highly efficient, accurately rated — Aerofin maintains its rated efficiency throughout the life of the installation. These carefully engineered coils are available in a complete range of sizes and types for any heat-transfer application.

Aerofin engineering service is available upon request.

Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

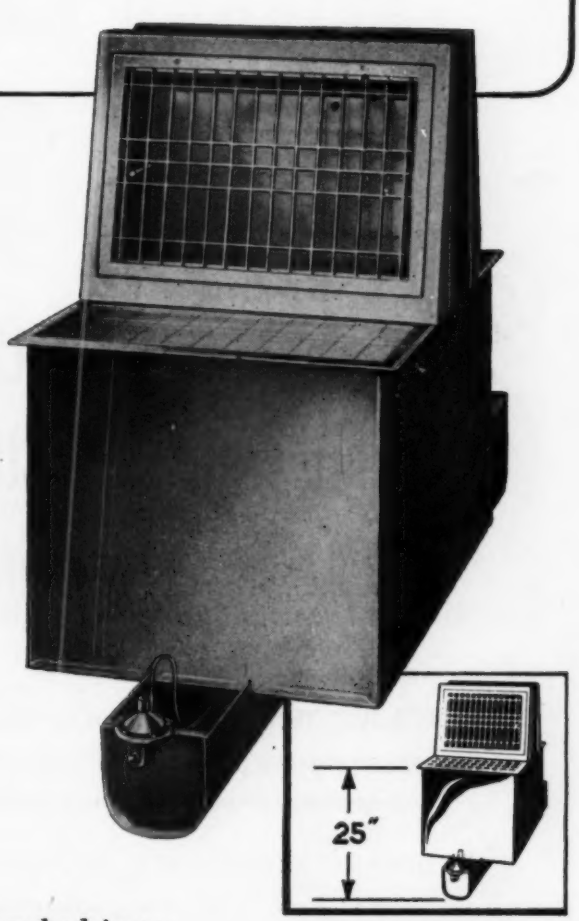
AEROFIN CORPORATION

410 South Geddes St., Syracuse 4, N. Y.

NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • MONTREAL

QUICKER...CHEAPER INSTALLATION GREATER CUSTOMER SATISFACTION

Because of these 3 Engineered Improvements in the Patented Holly Stubby



HOLLY has revolutionized floor furnace design — and installation — with the STUBBY Floor Furnace. Measuring only 25″ from finished floor to bottom of burner pan, the STUBBY is suspended from the floor joists, eliminating the expense of excavating and building a concrete pit. Floor and wall holes are roughed in to the *exact furnace size* and the STUBBY slips into place *from above the floor*. The finished floor is laid up to the furnace casing.

Exclusive shallow design

The patented STUBBY burner pan—another exclusive Holly engineered improvement—contains all valves, controls and burner elements. It is flood-proof and dirt-proof and is independently installed or removed for easy service. The STUBBY is watertight to within 19″ of the finished floor.

Installed from above floor — no pit required

These exclusive STUBBY features mean quicker, easier, cheaper installation and service and greater customer satisfaction.

Patented, quick-removable burner pan contains all working parts

ENGINEERED HEATING
HOLLY
Unless it's a Holly . . . It can't be a Stubby

Holly STUBBY Furnaces are available now in flat and dual types from 30,000 to 57,000 BTU input. They are sold only by licensed installing dealers. Qualified dealers are invited to write for details.

HOLLY MANUFACTURING CO.
875 SOUTH ARROYO PARKWAY, PASADENA 2, CALIFORNIA

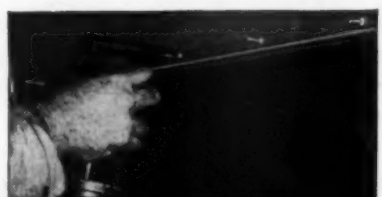
one-two-three! insert engage actuate!

3 simple steps to fast, secure fastening with **CHERRY** blind rivets

ONE MAN REPLACES TWO. Bottom of soda fountain shows Cherry Rivets. Body fastened with self-plugging rivets, foot with pull-through hollow rivets. One man does a fast, secure job.

IT'S JUST THAT SIMPLE. Insert the Cherry Rivet in the hole, engage the rivet, actuate the gun. A powerful controlled pull does the rest. This adds up to speed, speed, speed.

DYNAMIC EXPANSION of the rivet shank during installation means tight, strong, vibration-resistant joints. One man does it all. No bucking bars, no hammering. Just three simple steps to fast, secure fastening.

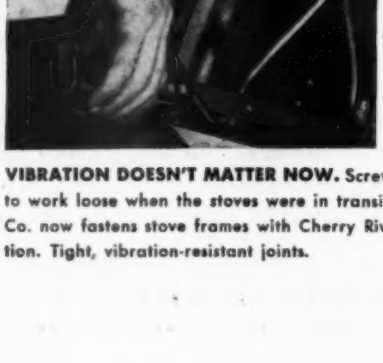


SCREWS WORK LOOSE. Cherry Rivets replace sheet metal screws in construction of refrigerated creamery trucks at Los Angeles Automotive Works. Screws had a bad record: 60% of screws would work loose within 6 months. Cherry Rivets have a perfect record of tight, vibration-resistant joints.

High strength self-plugging type Cherry Rivet

Tight-clinching pull-through hollow type Cherry Rivet

For more information write to Dept. 1-200, Cherry Rivet Co., 231 Winston Street, Los Angeles 13, Calif.



VIBRATION DOESN'T MATTER NOW. Screws and bolts used to work loose when the stoves were in transit. So J. H. McKie Co. now fastens stove frames with Cherry Rivets. Fast production. Tight, vibration-resistant joints.

CHERRY RIVETS, THEIR MANUFACTURE & APPLICATION ARE COVERED BY U.S. PATS. ISSUED & PEND.

Cherry Rivet Company
LOS ANGELES 13, CALIFORNIA

NEW HUMIDIFIER offers You NEW SALES and PROFITS!

COMBUSTIONEER HUMIDIFIER

***Automatically* maintains right humidity!**
Won't clog! Opens up huge new market!

All the accumulated experience of the makers of the famous Combustioneer Automatic Coal Stoker help make the new Combustioneer Humidifier outstanding. All the troubles found in ordinary Humidifiers have been eliminated. As a result, the new Humidifier is what your customers have wanted . . . a truly automatic Humidifier that maintains the proper humidity for health and comfort, without constant servicing or breakdowns.

Every feature of this new Humidifier is improved. It has up to 544 square inches of evaporating surface. All parts are durable, rust-proof, specially designed so lime deposits will not harm water flow. And it can be easily installed in 1, 2 hours.

And remember, *every* warm air furnace owner in your territory is a prospect! Yes, indeed, the new Combustioneer Humidifier means quick, easy sales and profits for you.

FITS ALL WARM AIR FURNACES
QUICKLY, EASILY INSTALLED
COMPLETELY AUTOMATIC
WON'T CLOG
UP TO 544 SQ. IN. EVAPORATING SURFACE
MADE BY RELIABLE COMPANY

MAIL COUPON TODAY

COMBUSTIONEER
The Steel Products Engineering Co.,
1275 West Columbia St., Springfield, Ohio

Please send me full information about the new Humidifier Sales Opportunity:

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ST. ADDRESS_____

CITY_____ STATE_____

The New Combustioneer HUMIDIFIER

WEBSTER ELECTRIC

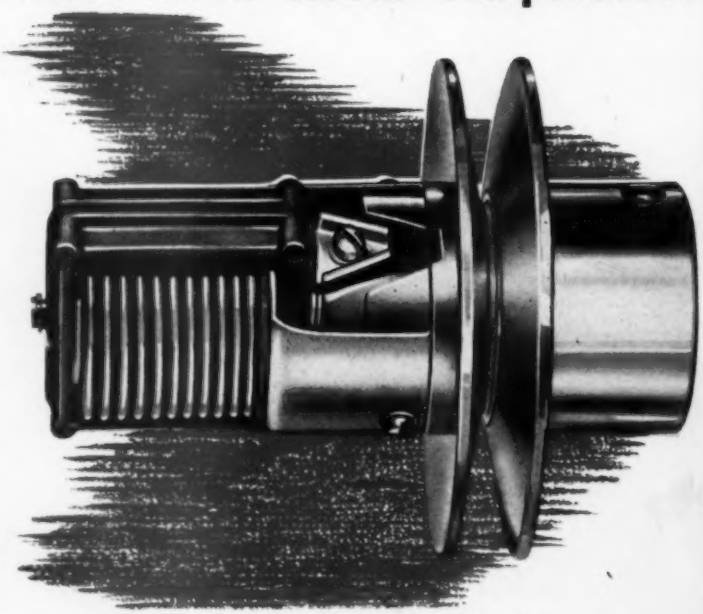
Thermodrive Meets Public Demand for Better Heat Circulation, More Even Room Temperature

Thermodrive is the latest refinement in home heating. It makes any blower a variable-speed blower, correlating its speed continuously with heat generated in the furnace.

The blower "cuts in" at slow speed as soon as the bonnet begins to produce usable heat at the start of the heating cycle (about 90°). As the bonnet temperature increases, blower speed increases in exact ratio, similarly decreasing its speed on the "off" cycle.

Results are better heat circulation—longer blower operation with lower average blower speed—reducing stratification to the minimum.

Thermodrive is ruggedly built, easy to install, positive in its operation. It can be applied to new equipment or old. Write for full information.



Years of Dependable Service Have Proved the Merit of Using These Webster Electric Products

★ *Fuel Units* *Transformers* ★

The "Know-How" gained in manufacturing hundreds of thousands of fuel units is behind the quality construction available today. This is evidenced by a long record of successful performance. Trouble-free, their performance proves you can buy them with confidence. Easily serviced—quiet running—simple mounting features and quick cut-off.

In Canada, made by Canadian Acme Screw and Gear, Ltd., Toronto, Canada.

Webster Electric Ignition Transformers are known for dependable instant starting. They are built in three sizes for universal adaptability and constructed with highest quality materials. Mica insulated core laminations are nonaging, high silicon content, special transformer grade stock. Secondary coils—wound to exacting standards, balanced and matched for weight, size, resistance and inductance. Convenient primary connections.

WEBSTER ELECTRIC

RACINE WISCONSIN

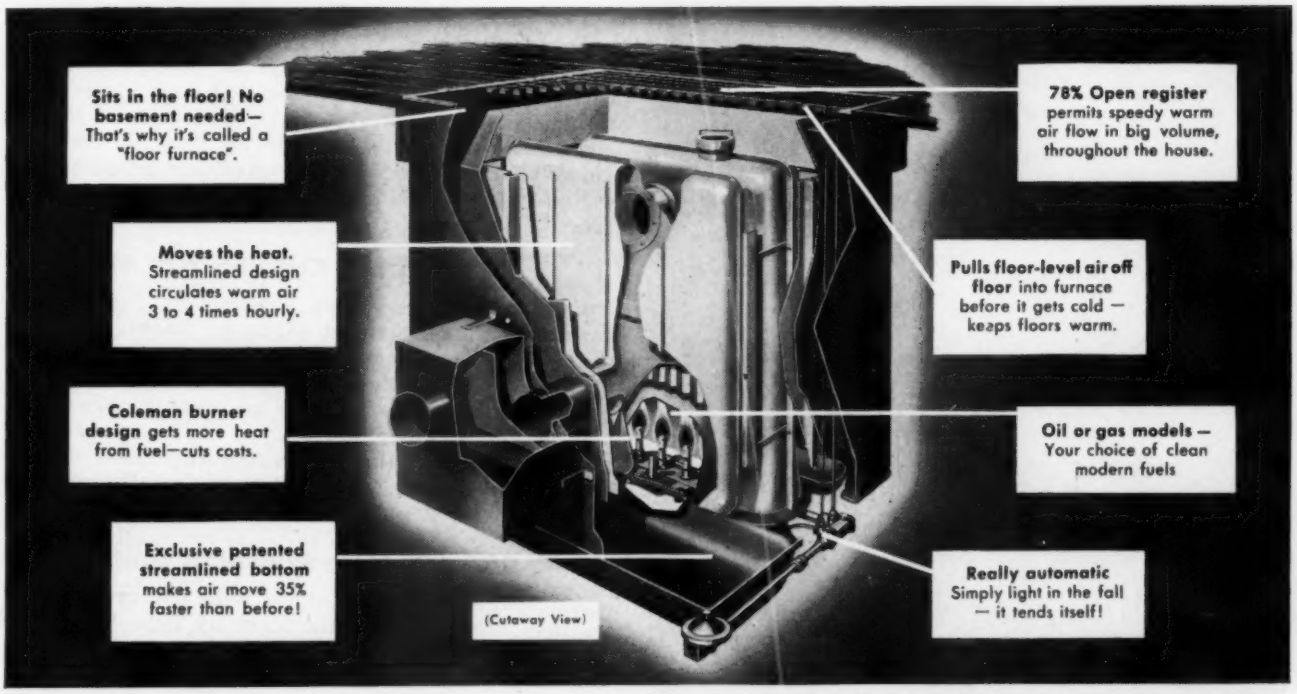
Established 1909

Export Dept.: 13 E. 40th Street, New York (16), N. Y. Cable Address "ARLAB" New York City

"Where Quality is a Responsibility and Fair Dealing an Obligation"

New Kind of Furnace!

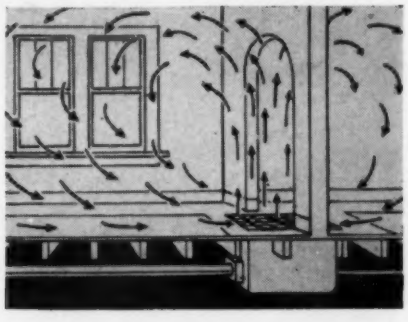
Engineered to meet all modern needs and proof-tested for performance


Sits in the floor! No basement needed— That's why it's called a "floor furnace".
78% Open register permits speedy warm air flow in big volume, throughout the house.
Moves the heat. Streamlined design circulates warm air 3 to 4 times hourly.
Pulls floor-level air off floor into furnace before it gets cold — keeps floors warm.
Coleman burner design gets more heat from fuel—cuts costs.
Oil or gas models — Your choice of clean modern fuels
Exclusive patented streamlined bottom makes air move 35% faster than before!
Really automatic Simply light in the fall — it tends itself!
(Cutaway View)

Coleman engineering research has developed this Coleman quality and performance

Solid comfort is the result of Coleman's engineering and research—a background of years that has taught Coleman how to make the most efficient use of all types of gas and oil heating equipment. When you install properly engineered equipment like Coleman's, your job is made easier and your customers happier.

Clean heat means satisfied women customers. Automatic, economical heat means satisfied men customers. "Warm-Floors" performance pleases the whole family. There are models for gas or oil —the clean, easy-to-handle fuels. So you satisfy everybody when you install dependable Coleman Floor Furnaces.



It really moves the heat. Arrows show circulation of warm air. Sits in the floor—a compact, completely packaged unit. No basement or air ducts needed. Easily hooked up to gas or oil lines and to chimney vents. A quick, clean, satisfactory installation can be made in 3 to 4 hours, average time.

There may still be a franchise for Coleman Floor Furnaces open in your community. Mail the coupon today for information to: The Coleman Co., Inc., Dept. AA-661, Wichita 1, Kansas; Philadelphia 8, Pa. (Terminal Commerce Bldg.); Los Angeles 54, Calif.

AUTOMATIC HEATING **Coleman**

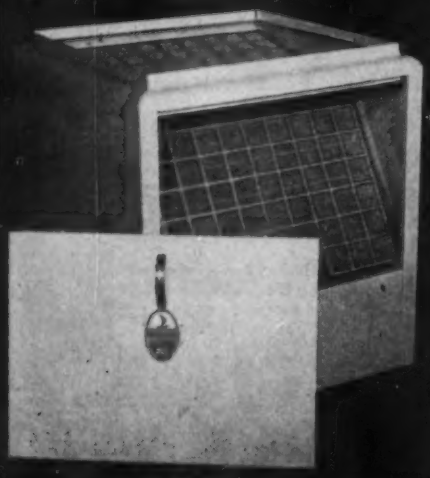
The Coleman Co., Inc.
Dept. AA-661, Wichita 1, Kansas
Please send me the name of my nearest Coleman distributor and information about your Floor Furnace Franchise.

Name_____

Address_____

Town_____ **State**_____

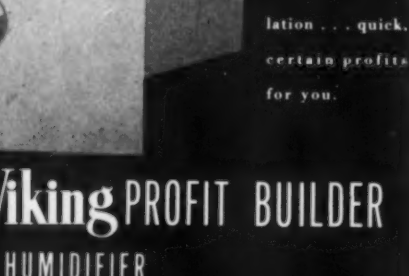
Be A Blower Dealer



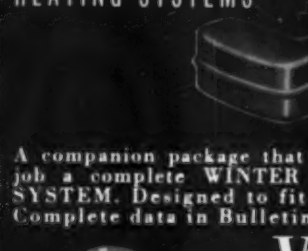
Convert any gravity furnace into a modern forced-air heating plant with the Viking Blower Package. Engineered for quick, easy installation . . . quick, certain profits for you.

ANOTHER Viking PROFIT BUILDER

SERIES 1100 HUMIDIFIER FOR FORCED AIR HEATING SYSTEMS



A companion package that makes your conversion job a complete WINTER AIR CONDITIONING SYSTEM. Designed to fit all types of furnaces. Complete data in Bulletin 349.



Viking No. 11 KIT

AUTOMATIC WATER PAN FILLER FOR USE ON ANY FURNACE

A complete package. Carry one at all times. Quickly, easily installed. Helps make an inspection trip a profitable call.

Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 157.

222—Catalog 47-12

Di-Acro Catalog No. 47-12 gives up to the minute information on the Di-Acro System of Die-less Duplicating. This 40-page catalog contains illustrations and specifications covering all Di-Acro benders, brakes, shears and rod parters which can be employed individually or cooperatively for precision production.—*O'Neil-Irwin Manufacturing Company, Lake City, Minn.*

223—Barber Catalog No. 47

Catalog No. 47 contains illustrations, descriptions, capacity ratings, and list prices of Barber standard gas conversion burners; also many types of special burners, jets and accessories for commercial and industrial applications, as well as pressure regulators and automatic control devices. It includes charts and tables of special value to heating engineers, dealers and gas authorities.—*The Barber Gas Burner Co., 3702 Superior Ave., Cleveland 14.*

224—BL Hole Punching Units

A 32-page illustrated catalog with photographs and tracings (in color) tell the story of Type "BL" hole punching units. The seven standard round and shaped hole units punch holes from .0937 to 2 in. in diameter in mild steel up to ⅛ in. thick. Step-by-step photographs illustrate how to set up these units on templates and T-slotted plates in press brakes and stamping presses and on rails in press brakes.—*Wales-Strippit Corporation, 345 Payne Ave., North Tonawanda, N. Y.*

225—Oxyacetylene Cutting

A 12-page reprint of an article entitled "Oxyacetylene Cutting in Sheet Metal Work" by R. F. Helmkamp is illustrated with 22 photographs and line drawings.

The first half of the article covers fundamentals of machine gas cutting, equipment needed and cost of operation. The last half concerns itself with specific shop applications of the process such as stack cutting. Reference is also made to the new Flux-Injection Method for cutting stainless steel.—*Air Reduction Sales Company, 60 E. 42nd St., New York 17.*

226—Protective Surface Coatings

A four-page bulletin presenting facts about rubber lined steel in industry and other protective surface coatings is available. Featured are tables giving resistance characteristics of rubber linings to inorganic acids, inorganic salts, alkalies and organic materials. Also covered are chemical abrasion and temperature resistance, and interesting data on a new form of rubber lining, and the Vulcalock process for permanent bonding to steel surfaces. This bulletin also outlines other industrial maintenance services including the application of Amercoat liquid vinyl coatings to insure against surface failure and metallizing for corrosion protection.—*Metalweld, Inc., Philadelphia 29, Pa.*

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 157.

227—Allegheny Metal

"Allegheny Metal in the Petroleum Industry" covers specific applications, performance records, etc., pertaining to the industry; also corrosion resistance, physical properties, fabricating procedures, and forms of Allegheny stainless available.—*Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80.*

228—Replaceable Filters

Bulletin 210 is an 8-page booklet explaining the application of replaceable type air filters—the Throway, Renu-Vent, and Type G Drifilter—for ventilating and air-conditioning systems. Descriptions and illustrations of each type filter are given, along with instructions for maintenance and detailed engineering and installation data.—*American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.*

229—Vent Pipe and Fittings

A complete line of gas vent and flue pipe—oval as well as around, and in 3, 5 and 10-ft. lengths—are pictured and described in a folder. Also shown are complete fittings for both round and oval pipe. These orange spiral marked pipes feature all-metal construction—inner tube of aluminum within a galvanized outer casings. Clock-spring steel spacers maintain clearance for dead air space insulation.—*Payne Furnace Company, Beverly Hills, Calif.*

230—Lessons in Arc Welding

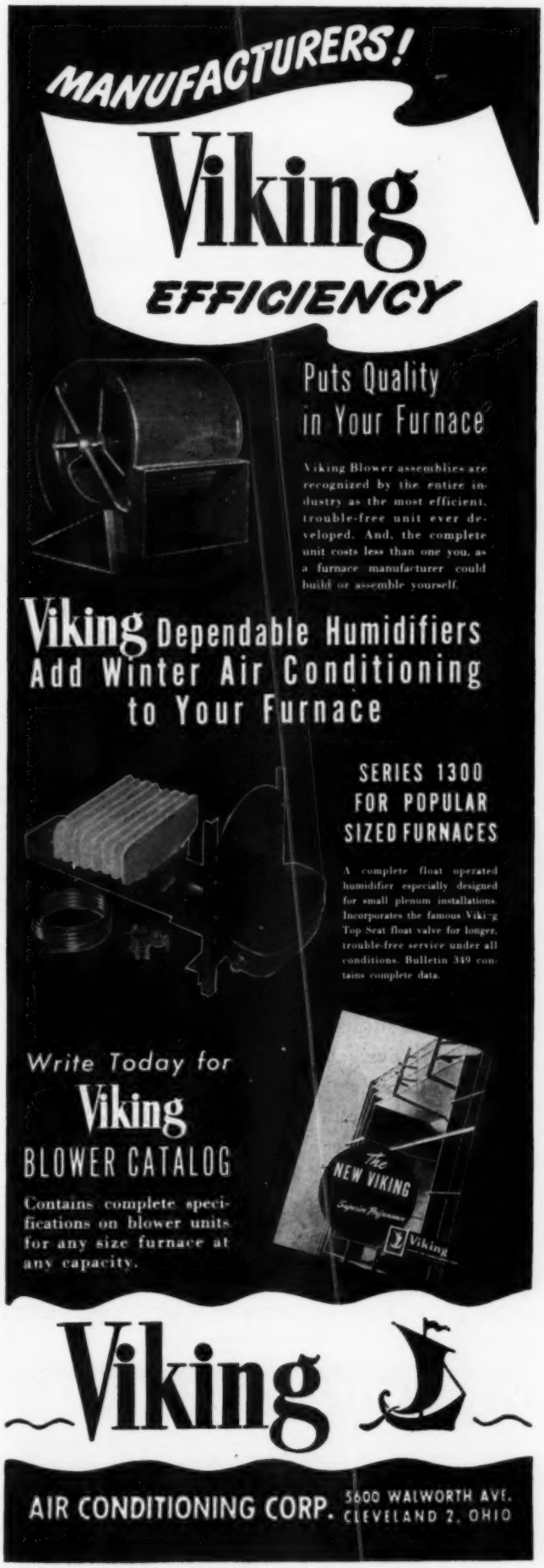
The third edition of "Lessons in Arc Welding" includes 58 lessons and explains the fundamentals of this method of joining metals by the fusion principle and incorporates a wealth of new information. Questions and answers occupy the last thirty pages.

There are 158 pages, 5½x8½ inches, 228 illustrations, including photos and drawings; cover, semi-flexible simulated leather, gold embossed; price postage prepaid United States 50 cents, elsewhere 75 cents per copy.—*The Lincoln Electric Company, 12818 Coit Road, Cleveland 1.*

231—SMA Technical Manual

The Stoker Manufacturers Association has just completed publication of the second edition of the SMA Technical Manual of the Underfeed Stoker Industry. First edition of the manual was in 1944 and contained basic data on the industry's standards, codes and recommended practices. These data are included in the new edition though it has been revised where needed and some of the charts and graphs have been redrawn.

Material added includes—smoke abatement; building requirements and recommendations (including notes and sketches on planning for a stoker installation and estimating coal bin capacities); automatic controls (a clear discourse on controls and control systems required for a good stoker installation); miscelleneous data (conversion, etc.). Especially valuable is the section on selection of stoker sizes and the one on SMA capacity rating. Price, $1.00.—*Stoker Manufacturers' Association, 307 N. Michigan, Chicago 1.*


MANUFACTURERS!
Viking
EFFICIENCY
Puts Quality in Your Furnace
Viking Blower assemblies are recognized by the entire industry as the most efficient, trouble-free unit ever developed. And, the complete unit costs less than one you, as a furnace manufacturer could build or assemble yourself.
Viking Dependable Humidifiers Add Winter Air Conditioning to Your Furnace
SERIES 1300 FOR POPULAR SIZED FURNACES
A complete float operated humidifier especially designed for small plenum installations. Incorporates the famous Viking Top Seat float valve for longer, trouble-free service under all conditions. Bulletin 349 contains complete data.
Write Today for Viking BLOWER CATALOG
Contains complete specifications on blower units for any size furnace at any capacity.
The NEW VIKING
Viking
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AIR CONDITIONING CORP.
5600 WALWORTH AVE. CLEVELAND 2, OHIO

Fresh-Air-Maker
direct driven
Exhaust Fans

★ ★ ★ Three fine models—12″, 16″, 20″ have been added to the famous Fresh-Air-Maker line and are ready for immediate delivery.

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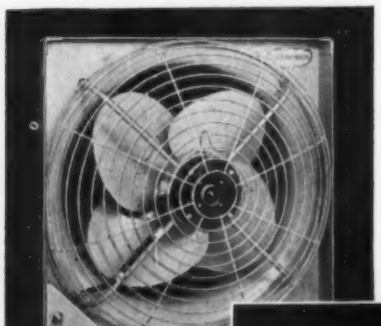

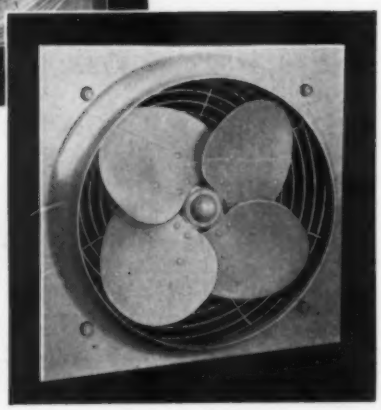

- 12″
- 16″
- 20″

All 3-SPEED fans—fine performers with high air delivery and surprisingly quiet operation. They are attractive in design and beautifully finished all over in ivory. Complete with cord and plug and convenient 3-speed pull switch so fan can be located high up and speed controlled if desired. Wire guards and manually operated louvers optional.

FRESH-AIR-MAKER, QUALITY • MATERIAL • WORKMANSHIP • PERFORMANCE • PRICED RIGHT

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WRITE FOR PRICES — IMMEDIATE DELIVERY

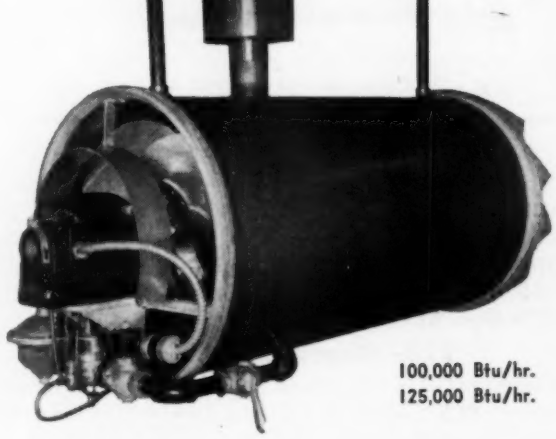
New Literature

SCHWITZER-CUMMINS

Ventilating Division

1145 E. 22nd STREET · INDIANAPOLIS 7, INDIANA

- BLOWERS
- VENTILATORS
- BLOWER WHEELS



100,000 Btu/hr.
125,000 Btu/hr.

JOHN ZINK
-New-
UNIT HEATER

This new and unique design in suspended space heaters features: More Head Room—Compact Design—More Heat from Gas Burned —Less Noise.

Where floor space is at a premium this turbine type unit has greater heating capacity. Controls are built in. One unit will heat a 40′ x 80′ space. It is A.G.A. approved for liquefied petroleum gases, manufactured, mixed or natural gas. Unit shipped completely assembled ready for installation.

- **Adjustable Louvers**
- **Available in Three Colors**

Write for Literature

John Zink Company

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TULSA, OKLAHOMA

New York — Salt Lake City — Houston — Los Angeles

New Literature

For your convenience in obtaining information regarding these items, use the coupon on this page.

232—Air-X-Hauster Results

Advantages gained by applying aerodynamic principles to ventilator design are fully described in a new brochure telling Breidert Air-X-Hauster results in wind tunnel tests and in actual use on all types of installations.—*G. C. Breidert Company, 3129 San Fernando Rd., Los Angeles 41.*

233—S-3 Slitting Shear

A specification sheet is being distributed illustrating and describing the S-3 post-war shear, with prices with-and-without the H. C. H. C. blades for cutting stainless, as well as extra blades. The side view illustration shows the adjustable shoe at the back of the upper blade holder.—*The Beverly Shear Mfg. Co., 3004 West 111th Street, Chicago 43.*

234—Hexdall Duct Hangers

A four-page folder tells the complete story of the new Hexdall duct hangers developed by Andy Hexdall, a sheet metal contractor of Morris, Illinois. Twenty-four ways to use these time and material savers are pictured on the second and third pages of the folder which is designed to hang on the wall in the shop or on the job.—*A. M. Hexdall Co., Morris, Ill.*

235—A Tour Thru the Empire Plant

A 16-page catalog, 8½ by 11, takes the reader on a tour through the plant where Empire gas floor furnaces are manufactured. Pictures show the forming presses (exerting pressures ranging from 75 to 500 tons); the electric welding equipment (electric resistance welders, automatic spot welders, and arc welding equipment); casings formed; burner production and testing; the assembly line (every 30 seconds a finished furnace—1,000 units daily); floor register construction; the engineering department and testing laboratory; the production control board; the patented Empire burner diagram; a cross section of the furnace showing features; the completed furnace as installed below the floor line; the double wall type; and specifications of all four models.—*Empire Stove Company, Belleville, Ill.*

American Artisan,
6 N. Michigan Ave.,
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "Equipment Developments" and "New Literature." (Circle numbers in which you are interested):

121	122	123	124	125	126	127	128
129	130	131	132	133	134	135	136
137	138	139	140	141	142	143	144
222	223	224	225	226	227	228	229
230	231	232	233	234	235		

Name .....

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Are you manufacturer? ☐ Jobber? ☐ Dealer? ☐

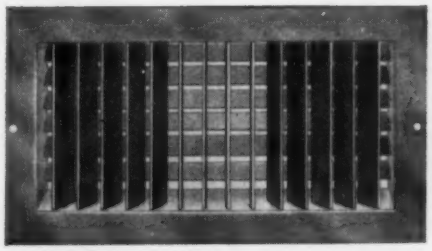
YOU CAN GET IT QUICKER FROM

STEWART

QUICK FACTS ABOUT HIGH VELOCITY OUTLETS MADE BY STEWART

The styles illustrated are typical examples of improvements in the Stewart line of Outlets, Wall and Baseboard Registers, Scoopaires and Radiator Fronts. All have been redesigned for smarter appearance, better diffusion and more flexible adjustment. The Stewart line is competitively priced and includes a wide range of popular types and sizes of outlets for air-conditioning, heating and ventilating. Special types and sizes can be made to your specifications.

PROMPT DELIVERIES ON STANDARD SIZES



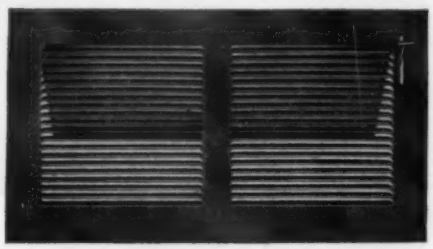
STYLE DDV

(2 Banks) Individually Adjustable Face and Rear Bars

Style DDV is one of 8 variations of Stewart High Velocity Outlets. By means of a detachable key, all bars are adjustable for directing air straight and at various right-left or up-down angles. Style DDV has vertical face bars and horizontal rear bars. Style DDH (not shown) has horizontal face bars and vertical rear bars. This type of outlet is made in popular sizes with or without lever-operated, multiple volume valves. Matching intakes are available. OUTLETS CAN BE SUPPLIED TO FIT CONTOURS OF CABINETS FOR ROOM COOLERS.

STYLE 91

Lever-operated Single Damper Wall Register

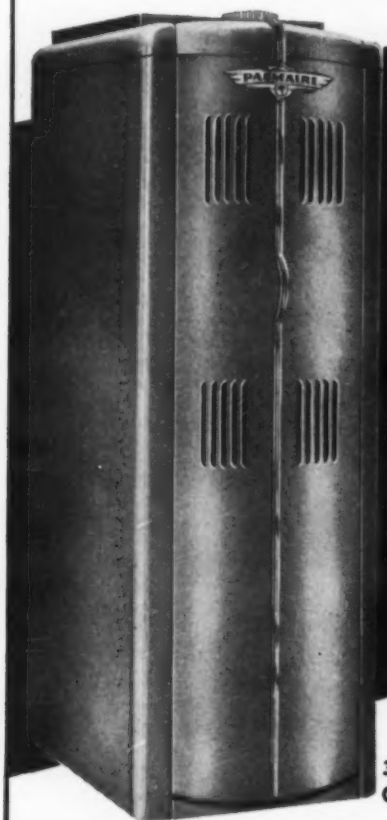


STYLE 91 is from the series 70-90 of Wall and Baseboard Registers made with single dampers, or multiple-valve dampers, both lever operated. Face bars of the 90 series are horizontal and set down at a 22 degrees angle. Face bars of the 70 series are vertical, set straight. Setting keys are furnished for user to alter bar settings. Matching, fixed bar grilles are available.

Send for literature and prompt quotation on your requirements

STEWART MANUFACTURING COMPANY
INCORPORATED
612 Bloomfield Avenue **Bloomfield, N. J.**

Tailor-Made
FOR THE AVERAGE SIZED HOME
Palmaire
FORCED AIR
GAS FURNACE



HERE ARE THE SALES-PULLING FEATURES:

- Perfect for 5 to 7 room homes.
- No basement required . . . compact unit easily fits into small closet or utility room. (Cooler can be connected to furnace duct system.)
- Completely automatic . . . thermostatically controlled for any desired temperature
- Burns LPG, manufactured or natural gas . . . **clean** constant heat at low cost.
- Approximately 80,000 BTU input with oversized blower (2,000 CFM) quickly and quietly banishes "COLD ZONES" from every room.
- All controls in front for easy inspection and adjustment.

38 Years of Air Conditioning Leadership

Palmer
MFG. CORP.
Phoenix, Arizona

Association Activities . . .

(*Continued from Page* 106)

Carolinas

THE August issue of "The Carolinas Roofer," published by The Carolinas Roofing and Sheet Metal Contractors Association, carries the first installment of the address of Robert M. Nelson, Marketing Service Department, Market Development Division, The American Rolling Mill Company, presented at the annual convention at Myrtle Beach on June 12. The second half will appear in the September issue.

The following committees have been selected:

Architects Committee: Victor King, Chairman; Ralph Barker, V. D. Ramseur, Sr.

Membership Committee: J. F. Pyle, Jr., Chairman, North Carolina; J. Roy Martin, Jr., Chairman, South Carolina; James Barger; W. R. Hartin, Jr.

Publicity Committee: W. T. Fort, Chairman; R. B. Spell, Jr., L. K. Flynt.

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Legislative Committee: W. P. Baker, Geo. Owens.

Sick and Welfare Committee: J. A. Caison, Chairman; C. E. Pope, C. P. Stanly.

Emblem and Sign Committee: J. A. Piper, Chairman; Joe H. Piper.

Heating Forum

"Indoor Comfort" was the theme of the heating forum held at the Myrtle Beach convention, with Dan Lynch, manager of the educational department of the Lennox Furnace Company, in charge of discussion. Mr. Lynch outlined the latest procedure as set forth by the National Warm Air Heating and Air Conditioning Association for the setting of controls, the setting of the blower speed and the amount of oil to be consumed.

The matter of register locations was not fully settled because the "Yankees" and the "Southerners" chose sides, the "Yankees" for high side wall registers, and the "Southerns" for baseboard registers. As near constant blower operation as possible was emphasized.

One of the most interesting portions of this forum was the explanation and demonstration of an electronic air cleaner built to be used as an individual unit or in conjunction with a blower type heating system. The air cleaning device is very efficient but still somewhat expensive. Horace King furnished and transported this air cleaner to the convention headquarters.

The King Roofing and Manufacturing Company passed out memo pads and pencils at the Myrtle Beach convention, also a very handy combination spoon and bottle opener.

The September issue mentions the passing of Otis A. Moran, secretary of the Raleigh Association of Roofing and Sheet Metal Contractors.

Three new members are: Carolina Roofing & Sheet Metal Works, Myrtle Beach, S. C.; Southern Blow Pipe Co., Hickory, N. C.; and Hodgin Roofing & Supply Co., 921 W. Lee St., Greensboro, N. C.

There are fifteen or twenty more good concerns in the Carolinas who should be members of the Carolinas association and they are invited to send a card to box 599, Greenville, S. C.—J. A. Piper, Editor.

Kling
ROTARY SHEARS
DO MANY TYPES OF WORK

DOES ALL THIS WORK FOR YOU

1. CUTS STRAIGHT LINES
2. CUTS RINGS—SMALL OR LARGE RADII
3. CUTS CIRCLES
4. MAKES FLANGES
5. CUTS INSIDE HOLES WITHOUT CUTTING IN FROM EDGES
6. JOGGLES & OFFSETS
7. CUTS ODD SHAPES
8. BEVELS OF ANY ANGLE
9. CUTS REVERSE CURVES
10. BEADS & U'S

ALL WITH Hairline PRECISION

Yes, and With Hairline Precision

Rapid operation . . . Hairline Accuracy . . . the use of Kling Rotary Shears marks the latest development in cutting mild steel, and sheet metal, up to 1-inch with amazing savings in time, labor, and production costs.

For exacting projects (see illustration at the right), no single unit of metal-working equipment does so many different things so clearly and efficiently as does the Kling Rotary, pictured above.

In metal working plants, automotive, aviation, home appliance, and other industries, where work of this character is being done, — this machine is held in high regard for its versatility and economy of operation.

This great usefulness is the result of half-a-hundred years of engineering experience which prospective buyers, with reason and repect, applaud.

Send Today for Bulletin No. 245

which will give you specific facts, and specifications. No obligation involved. Users of heavy equipment of Kling Rotary Shears' class will receive a copy of this Bulletin promptly, on request.

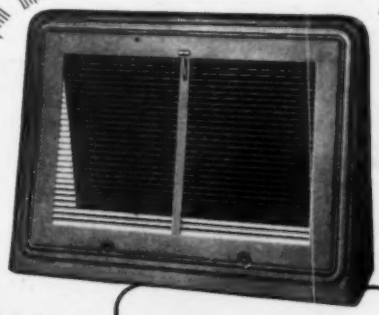
KLING BROS. Engineering Works

1325-AA No. Kostner Ave., Chicago 51, Illinois

EXPORT DEPT. 1111 South Ferry Building, New York 4, N. Y.

Warm Those Floors

People live on the floor... *not* on the ceiling!



The function of every heating contractor is to provide his customers with ample, comfortable heat —at the level where they live. This can best be done—and no research has yet disproved it—by installing No. 40 Series U. S. Baseboard Registers which blanket floors and living portion of rooms with free-flowing clean warmth.

No. 40 Series
GRAVITY BASEBOARD
REGISTERS

"The Cream of the Lot" — smart, modern design — no loose screws to be lost — less installation cost. Centers easily removed or attached with Engaging Buttons. Horizontal Bar Design creates non-vision of Interior and performs a perfect Directional Flow.

☆ ☆ ☆ ☆ ☆

US

UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

Association Activities . . .

Indiana

THE thirtieth annual convention of the Sheet Metal and Warm Air Heating Contractors Association of Indiana, Inc., will be held at the Hotel Severin, Indianapolis, on Thursday and Friday, February 5-6, 1948.

Plans are being prepared to make this the most outstanding convention the state association has ever held, and from all reports the attendance will greatly exceed all past records. It is advised that hotel reservations be made now.

Canadian NWAH&ACA Chapter

PRESENT plans of the Canadian Chapter of the National Warm Air Heating and Air Conditioning Association call for some ten schools to be held from coast to coast, commencing early in 1948, as against seven schools last season. Non-member jobbers and installers across Canada are invited to take out membership beginning with the fiscal year of October 1, 1947. The associate membership fee is $10 per fiscal year for installers. Only members and associate members or their employees are permitted to attend these engineering schools and certificates of proficiency are granted to those who obtain a satisfactory standing.

Other benefits of membership are literature on new and interesting developments in the trade; a subscription to the Canadian Chapter's monthly news letter containing highlights of what is taking place in the chapter, together with items of interest to the trade; cuts and decalcomania of the association emblem for advertising and display purposes.

The Canadian Chapter membership now numbers twenty-four manufacturer members and three hundred and fifty associate members.—C. B. Taylor, Managing Director, Toronto 12, Ontario.

With the Contractors...

Wisconsin Furnace—Parker's Distributor

The Wisconsin Furnace Company is the new owner of the former Parker's Distributors, Inc., located at 27 North Charter Street, Madison 5, Wis. The company will continue to distribute warm air heating equipment—coal, oil and gas furnaces, stokers, oil burners, fans, fittings, registers, etc.

C. W. Vaughan is president and general manager.

Lartz Opens Sheet Metal Shop

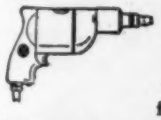
Melvin Lartz, for eighteen years an employee of the MaGirl Foundry and Furnace Works, has opened a sheet metal, ventilating, heating and furnace repair business at 607 South Hannah Street, Bloomington, Ill.

The new shop is housed in a new concrete block building with brick front. Mr. Lartz has employed a five-man veteran force, including Delmar Martens, Alvin Lawson, Edwin Forbes, Calvin Meyers and Charles Eby.

Here's Your "Handful of Power" for Continuous Drilling

A Black & Decker Electric "HOLGUN"* is an easy drill to handle, weighs only three pounds, measures only 6¾" overall. Yet, this compact tool has abundant power for continuous drilling that saves time in all kinds of heating, piping and air conditioning jobs.

Drives twist drills up to ¼" . . . wood augers up to ½" . . . small wire brushes for cleaning and burnishing . . . B & D Hole Saws for cutting clean, round holes up to 1⅛" diameter in any material a hacksaw will cut. Ideal for working in hard-to-reach places. Requires less muscle to operate. Smooth housings, with famous "Pistol Grip and Trigger Switch," fit naturally into either hand.



Black & Decker Electric "SCRUGUNS"* are perfect team-mates for these drills to speed up many sheet metal assembly operations. Shaped just like the HOLGUN. Insure greater accuracy and uniformity with minimum operator fatigue. For full information on HOLGUNS, SCRUGUNS and many other Portable Electric Tools, see your nearby Black & Decker Distributor. Write for free catalog to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.

LEADING DISTRIBUTORS EVERYWHERE SELL

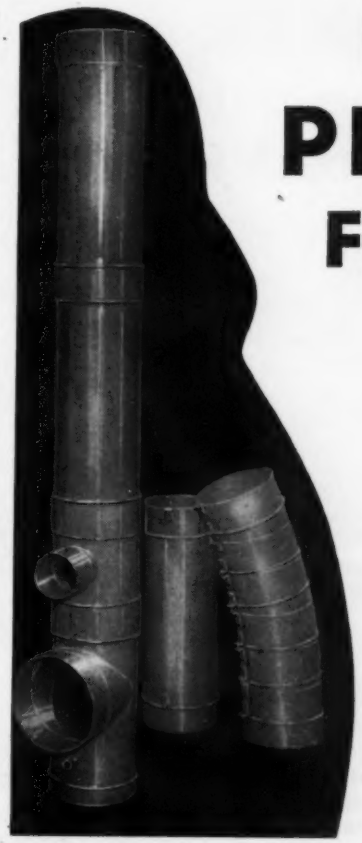
Black & Decker

PORTABLE ELECTRIC TOOLS

ELECTRIC DRILLS

ELECTRIC SANDERS

ELECTRIC SAWS



EXTRA PROFIT For You

Install VITROLINER CHIMNEY LINING

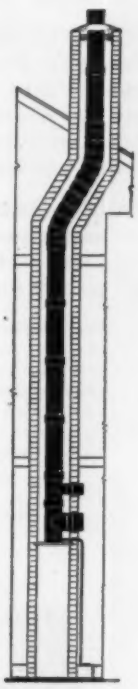
Dealers—You can quickly build up a thriving business lining old or new masonry chimneys—ideal for gas or oil fired heating plants where protection against acid bearing *condensation* is important.

VITROLINER insures longer life to the chimney—increases stack temperature (heats and cools quickly) providing better draft to carry gases out of chimney.

VITROLINER is made of heavy gauge steel completely coated inside and out with acid resisting porcelain fused into the steel at 1575° F. to prevent corrosion. VITROLINER drains the condensate harmlessly away into the ground preventing deterioration of brick work.

VITROLINER can be installed in a few hours. It will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT.

VITROLINER has been used for the past 18 years and is proven through a long field record.

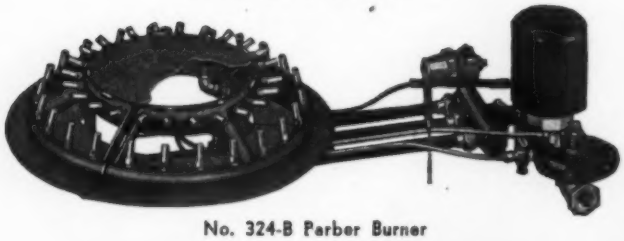


We invite correspondence from reliable dealers who can contact and service installations in a few still available cities.

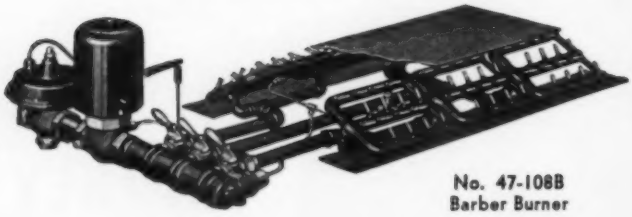
Write today for literature and prices.

CONDENSATION ENGINEERING CORPORATION
122 S. MICHIGAN AVE. CHICAGO 3, ILL.

Why BARBER Leads All Conversion BURNERS



No. 324-B Parber Burner



No. 47-108B
Barber Burner

PERFECTED DESIGN: These are no ex-*perimental* burners but tried and tested in many thousands of installations over a thirty year period. That means trouble-free operation, fewer complaints, returns, and service charges.

OUTSTANDING EFFICIENCY: Famous patented Barber air-activated jets (available in no other burner) assure the most intense heat with a true "scrubbing" flame action on all walls of fire-box.

DIRECT ACTION: This flame is applied direct to walls of combustion chamber—no refractory, no spreader.

GREATEST ECONOMY: Thorough combustion gets the most from the fuel, the most from the equipment. Also, a Barber job includes no fancy trimmings, which add to the cost but not to the utility. You can even, in most cases, use the existing automatic controls, if the owner has them.

TAILOR-MADE FIT: Barber models are furnished in proper sizes for all round or oblong furnaces or boilers, and are further adjustable to correctly fit all grate dimensions.

All the points above are strictly relevant to the *value* of any conversion burner purchase. Remember, too, that Barber is the pioneer specialist in the design and development of every type of burner unit for all gas appliances, and freely offers its engineering facilities for your use. Ask for complete Catalog showing all Barber products.

THE BARBER GAS BURNER CO.

3704 Superior Avenue **Cleveland 14, Ohio**

BARBER BURNERS

With the Contractors...

Memphis Firm Expands

THE Memphis Air Conditioning Company, 8 North Front Street, Memphis, Tennessee, opened a new store at 500 South Main Street early this summer. The main reason, according to E. T. Kinney, was to provide more display space and storage, as well as

The New Store

space for loading and unloading (loading and unloading at the Front street shop had become a problem).

The company has been very busy this summer distributing Curtis packaged units in mechanical refrigeration, Air-Champ evaporative coolers and Gar Wood forced air furnaces. They have taken on the Iron Fireman distributorship for Memphis, quite a few counties in Mississippi, a few counties in Arkansas and also West Tennessee. They are busy installing heating.

Keller Metals Enlarges Plant

A LITTLE over a year ago Keller Metals, Inc., of Bakersfield, California, completed an addition to their plant at 321 Twenty-first Street to house a new 400-ton Bliss press and to furnish space for an assembly line. The company is now producing evaporative air coolers in a number of sizes.

In the sheet metal department of their plant, the company manufactures anything made of sheet metal, specializing in stainless steel restaurant equipment and store fronts. They do considerable heating and ventilating work. George S. Keller is president.

U. H. Engineering Laboratory

The $150,000 engineering shop laboratory, under construction on the University of Houston campus, will be open to students by mid-September, Dr. W. W. Kemmerer, assistant to the president, announces. Funds were contributed by Mr. and Mrs. H. R. Cullen.

Courses in hydraulics, metallurgy, heat treatment, electricity, air-conditioning, materials testing, petroleum and chemical engineering will be offered in the laboratory during the fall term.

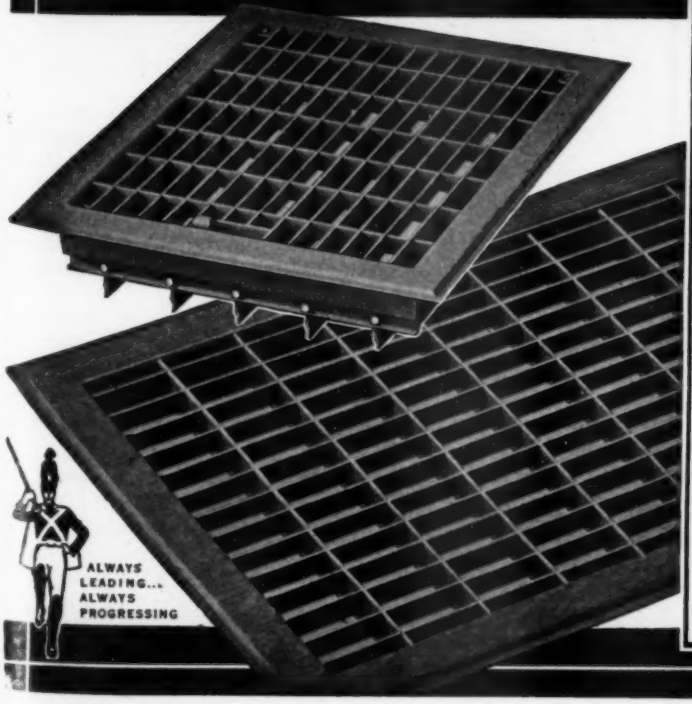
The building is of steel construction with a concrete base. A second building of the same type for maintenance and warehouse space is under way.

★

Sheet metal men everywhere are turning out accurate work quickly and easily with Niagara machines and tools for shearing, blanking and forming sheet metal.

NIAGARA
MACHINE & TOOL WORKS
BUFFALO 11, N. Y.
District Offices:
Detroit, Cleveland, New York

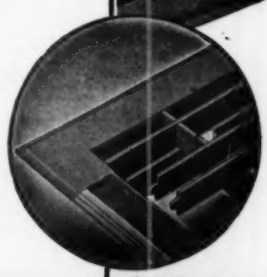
INDEPENDENT "Fabrikated" REG. U. S. PAT. OFF.



REGISTERS AND COLD AIR FACES

"Fabrikated" products were originated by Independent and are backed by 47 years' experience in the register field.

Standardize with Independent "Fabrikated" floor faces and registers. You will have a source of supply of proved dependability. Complete information will be supplied to you gladly on request.



THE INDEPENDENT REGISTER CO.
3747 E. 93rd ST.,
CLEVELAND 5, OHIO

SUN FUEL MASTER

OIL BURNING FURNACES

ATTRACTIVE AND DEPENDABLE AVAILABLE EFFICIENT NOW!

PRICES ARE RIGHT
DELIVERIES ARE IMMEDIATE
FRANCHISES ARE AVAILABLE

Five Sizes—Bonnet Deliveries—
80,000 — 100,000 — 135,000 — 165,000
and 200,000 B.t.u.

We are now back in full production in our brand new factory building — making more and better SUN Fuel-Master Automatic Oil Furnaces than ever before.

NEW SIX-PAGE BROCHURE NOW READY.

J.V.PATTEN COMPANY
Sycamore, Ill.

With the Manufacturers

In the photograph M. P. Langdoc and H. C. Perry of the Oil-O-Matic Export Department inspect a recent shipment to Norway. The Prince lives near Oslo.

After visiting eight foreign countries in 30 days in a fast 15,000-mile flying trip, W. A. Matheson, executive vice president of the Williams Oil-O-Matic Division of Eureka Williams Corporation, and M. P. Langdoc of the Export Department are back in Bloomington making plans for extensions of export trade.

Mr. Matheson discussed export business from the viewpoint of factory production. "It is highly desirable," he said, "because most of it is sold during the customarily off-season months in the domestic oil burner business and helps keep production lines working.

"Extreme care is exercised by foreign finance ministers to see that dollar credits issued to those in trade are for the stated purpose.

"Countries in Europe are referred to as being on a hard currency basis or soft. We trade with those enjoying a hard money economy. We extend our trade to those on a soft money (which includes the pound sterling) only through a hard money country, where a trading relationship exists between such a country and one of the soft money countries.

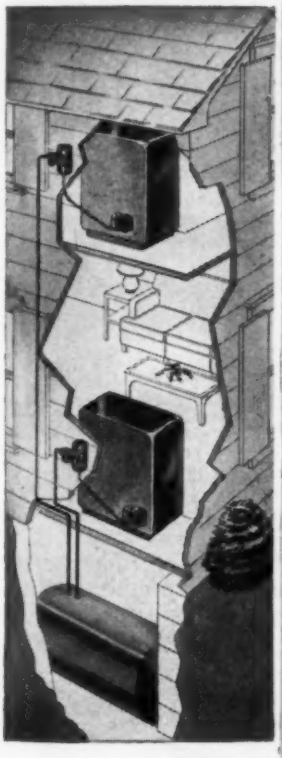
"For instance, Switzerland can trade with Austria through an arrangement of their own, hence American goods can be purchased with American dollars supplied by Switzerland, then resold to Austrian purchasers on the basis of trade established between the two countries. Similarly Sweden, with dollars, can purchase a limited quantity of goods which in turn is traded to Denmark and Finland.

"This, however, represents a highly restricted and limited volume since the dollar countries have by no means an unlimited supply and are interested in seeing their dollars go principally for those goods which we make and they need and want for their own consumption.

"By and large, the dollar supply of any European country is limited by the exports of that country to hard money countries, ourselves being number one. In their present state of dire need, most European countries are exporting far less than they are importing. Naturally, their dollar supplies are dwindling."

The itinerary of Mr. Matheson and Mr. Langdoc included England, Norway, Holland, France, Belgium, Sweden, Switzerland and Portugal.

For Quick Fall Sales

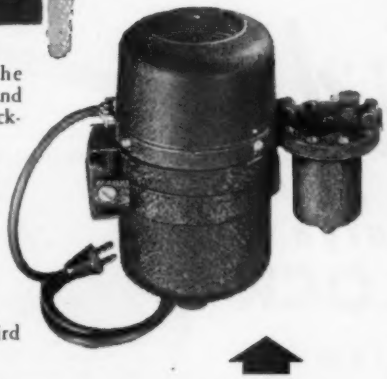


. . . INSTALL OILIFTER IN ALL VAPORIZING TYPE OIL HEATERS

Moves Oil from Basement to Burner Automatically

- Ends Oil Handling in the home.
- Eliminates need for fuel tank on appliance.
- Saves Time and Oil on *ANY* Vaporizing Oil Burning Heater, Furnace, or Range.
- Lifts Oil 25 feet high or 100 feet horizontally from bulk storage tank to appliance.
- Easy to Install — Only Single ¼" copper tubing required. No return line.
- Capacity, 1¼ Gallons per hour, sufficient for more than one appliance.
- *PAYS FOR ITSELF IN LABOR-SAVING, FUEL-SAVING, MORE CONVENIENT HEATING.*

Your customer starts the OILIFTER in the Fall—and forgets all about messy "bucketing" of oil between bulk tank and heater. No more oil carrying, no spilling waste of oil, no dripping on floors or rugs. The A-P OILIFTER does this task AUTOMATICALLY, from basement or outdoor tank to first, second, even third floors.



A-P OILIFTER with Filter Unit. Can be installed on ANY vaporizing burner appliance requiring oil flow up to 1¼ gallons per hour.

• • •

FOR: HOMES • TOURIST CAMPS • STORES • SCHOOLS • GARAGES • CHURCHES • HALLS

Sell the A-P OILIFTER to your old customers — and as extra equipment on new heater sales! You'll build greater enthusiasm for oil heating, increased satisfaction and good will — and greater profits. Send today for sales bulletins and full information.

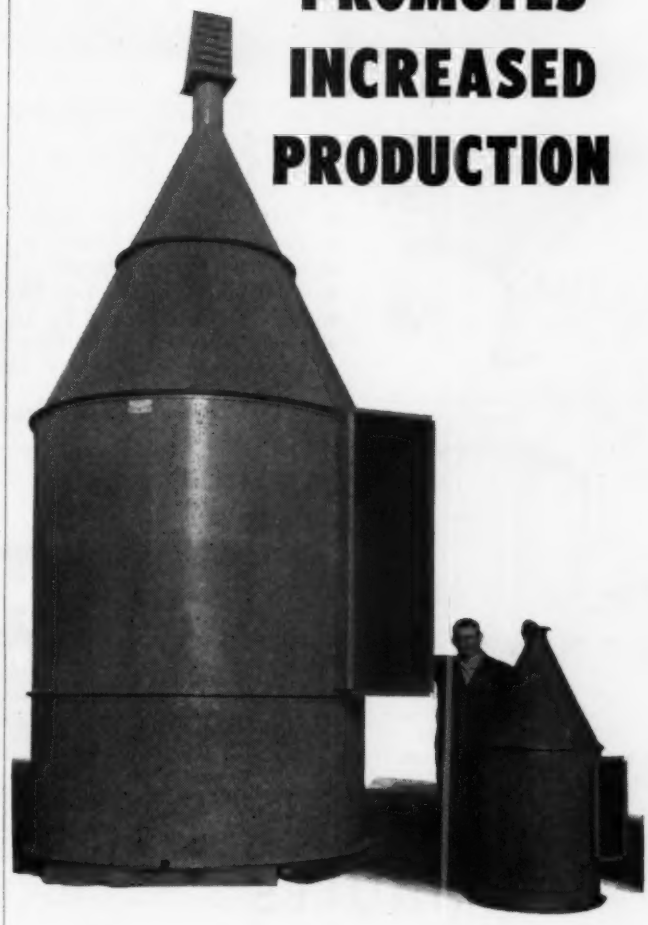
AUTOMATIC PRODUCTS COMPANY

2452 North Thirty-Second Street • Milwaukee 10, Wisconsin

DEPENDABLE *Oil Controls*

DESIGNED TO ELIMINATE SERVICING

DUST-FREE AIR PROMOTES INCREASED PRODUCTION



● Dust-free air is an important factor in worker's efficiency. Respirators and masks are a nuisance and prevent men from putting forth their best efforts.

The simplest, surest and most satisfactory way to solve a dust problem is by installing Morse Rarefied Collectors on dusty operations. We make them in a wide range of sizes. The large unit shown here will handle 16,000 C. F. M. of heavy dusts. The small one will handle 1100 C. F. M.

Goergen-Mackwirth collectors are highly efficient. Their first cost and maintenance is low. They are self-dumping. No cleaning is necessary. There are no replacement bags, plates or oil spray. The only electric current required is for the fan motor.

Write for complete information

Goergen-Mackwirth

ENGINEERING CO.

813 Sycamore Street Buffalo 12, N. Y. Phone: Cleveland 6661

SPECIALISTS IN THE MOVEMENT AND CONTROL OF AIR

WHY DEALERS WANT THE HART LINE

HART Conversion Oil Burner

HART Oil Fired Winter Air Conditioner

★ HART Line Is A Complete Line — Includes Oil, Gas and Coal Units.
★ HART Line, Because It Is Complete, Creates Increased Sales.
★ Exclusive HART Franchise.
★ Prompt, Assured Deliveries.
★ Generous Profit Margin.
★ High Quality, Low Cost Make HART Heat Easy To Sell.
★ HART Heat Backed By 26 Years Of Experience.
★ Smartly Styled, Quiet Operation, Low Cost Performance.
★ Engineered Equipment — Easy To Install, Easy To Service.

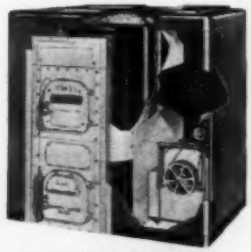
A Few Franchises Still Available

HART equipment is sold internationally through better distributors. Write for the name of the distributor nearest you.

"Home is where the HART is"

HART
OIL BURNER DEPARTMENT
of
AVERY FARM MACHINERY CO.
PEORIA, ILLINOIS

HART Gas Fired Winter Air Conditioner



HART Coal Fired Winter Air Conditioner

Change
MINUTES
to SECONDS
with

Riverside

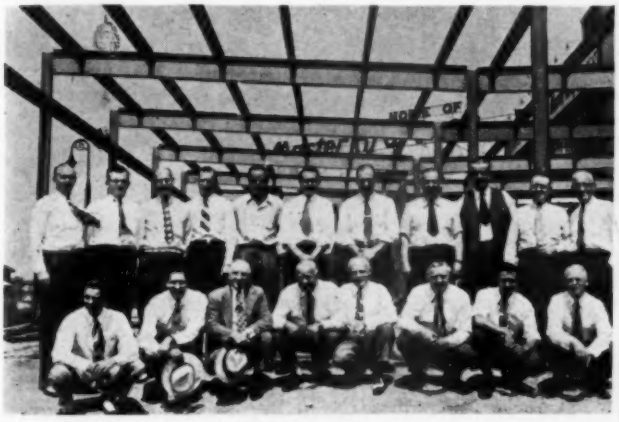
Pittsburgh "DUO-LOCK" Machine

Locks that used to take several minutes can now be formed in just a few seconds with a Duo-Lock. Forms Pittsburgh Locks, Double Seam Locks, Right Angle Flanges and Drive Cleats, and can be set up for two forming operations at one time. No adjustments are necessary for the different gauges making it possible for an inexperienced operator to work this machine which simply plugs into an ordinary light socket.

RIVERSIDE MACHINERY COMPANY

Shakopee **Minnesota**

With the Manufacturers



Harvey-Whipple, Inc., producer of Master Kraft oil heating equipment, held its annual sales conference in August and the photo shows sales executives and field men of the eastern half of the United States gathered in front of the factory addition.

Moving production lines will be set up in this section to turn out complete new boiler and warm air units.

Opening of a Richmond, Va., office of the Sturtevant Division of the Westinghouse Electric Corporation at 218 Travelers Building, 1108 East Main Street, has been announced by A. G. Mutimer, the division's Middle Atlantic district manager.

Joseph A. Hagan, Jr., a graduate of Virginia Military Institute, who was a Marine captain in World War II, is manager of the new office. He is a native of Norfolk, Va.

Edward I. Alter is now a sales representative for General Electric air conditioning, heating and refrigeration products in the Northwestern District with headquarters in Salt Lake City, Utah.

Mr. Alter graduated from the University of Utah in 1930 with a B.S. degree and joined G. E. the following year. He was in the Field Engineering Division until his present assignment.

Owens-Corning Fiberglas Corporation announced the following personnel changes in the Toledo general offices:

F. L. Myers has been appointed manager of the corrosion products sales section of the industrial division. Since the fall of 1946, Mr. Myers has been manager of the farm market products section of the building materials division. From 1943 to 1945 he was manager of the Fiberglas Chicago office.

R. E. Brown has been appointed manager of the home insulation sales section of the building materials division.

The following branch office personnel changes are announced:

M. W. Butler has been appointed manager of the Fiberglas Corporation's New York office; W. R. Thomas, manager of the Philadelphia Fiberglas office; A. E. Kincaid, manager of the company's Pittsburgh office.

TO 1,000,000 HOME OWNERS

VENTALARM

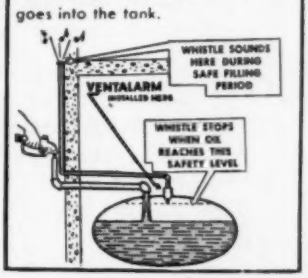
T. M. Reg. U. S. PAT. OFF.

CONVENIENCE AND ECONOMY!

Driver need never enter the home — complete convenience for housewife.

Every stop a drop — no non-deliveries, no call-backs

Fast-filling, non-spilling All the oil goes into the tank.



Offer a customer extra convenience and economy in his home and chances are you've made a sale. That's why the VENTALARM Fill Signal can be found today in more than a million oil-heated homes across the Nation.

VENTALARM Signal is designed for use on cellar oil storage tanks, designed to make oil burner installations completely automatic. Its whistling note ceases the instant the tank has been properly filled, insures that all the oil goes *into the tank*, without overflow or spillage.

VENTALARM Signal guarantees "come-and-go" freedom to the home owner. No need to wait around — the driver need never enter the home to make his delivery. Because of this guarantee of efficiency and economical, convenient service, VENTALARM is in greater demand today than ever before.

VENTALARM Signal is quickly and easily installed on new tanks and existing installations. Write today for complete details and special customer mailing folders. Use VENTALARM on YOUR Burner installations!

VENTALARM
Whistling TANK FILL SIGNAL

Purchase VENTALARM through your regular supply house.

Canadian Licensee EMPIRE BRASS MFG. CO., LTD., London, Ontario

With the Manufacturers

Three appointments to branch offices were made recently by the Herman Nelson Corporation, Moline, Illinois, manufacturers of heating and ventilating equipment.

Mr. Charles W. Trambauer, formerly manager of Mid-States Industrial Corporation, a wholesale plumbing, heating and mill supply firm of Rockford, Illinois, was appointed manager of the Detroit branch office, to handle sales of the company's line of unit heaters, unit ventilators, propeller fans, unit blowers and centrifugal blowers. Robert G. Keller, product application engineer in that office for the past six months, will assist Mr. Trambauer.

Charles R. Anderson of the Philadelphia branch office has been appointed product application engineer in the Syracuse branch office. Before going to Philadelphia, Mr. Anderson had been sales promotion and advertising manager in the home office.

Charles R. Holsclaw was assigned to the staff of the Pittsburgh branch office as a product application engineer. Mr. Holsclaw, a graduate of the U. S. Naval Academy, was formerly project engineer with Dupont Ammonia Division at Charleston, West Virginia.

The Cor-o-Aire Corporation of Cleveland, Ohio, has made a major revision in its sales policy. In the past Cor-o-Aire gas furnaces were available only through distributors, but now the company has announced that it will market the units direct to heating dealers.

Cor-o-Aire manufactures units that operate on all types of gas, including LP.

William B. Forrest has been appointed factory representative for the state of Michigan by General Filters, Inc., 12890 Westwood, Detroit, Mich. He will have charge of General's fuel oil filters.

Recent Deaths In The Industry

Henry Morrison Reed, 66, chairman of the board of the American Radiator & Standard Sanitary Corporation, died in Allegheny General Hospital August 12 after a long illness.

The dynamic leader of the world's largest concern manufacturing heating equipment and plumbing fixtures had been ailing for several months.

Mr. Reed's entire business career was devoted to American-Standard and its predecessor companies. He was widely known and respected, not only in the plumbing and heating industry, but in business circles everywhere.

Powell Pardee, special representative in the New York District Sales Office of the Inland Steel Company of Chicago, who died August 9 at 64 years of age, had been with Inland since October, 1905.

Mr. Pardee died in his suite in the Ritz Tower Hotel, New York City.

He commenced his career with Inland in 1905 as assistant shipper in the 24-inch mill. Associated with the company for 42 years, Mr. Pardee had managed the Company's Order Division in Chicago for a long period prior to 1940, when he transferred to New York City.

"Next Time Let's Buy PREMIER"

PREMIER Furnaces Are Pre-Fitted at the Factory, for Fast, Easy Installation

A lot of dealers have told us that PREMIER Furnaces can be installed easier and quicker than any other make. If that is true, it is due to the extra precautions taken at PREMIER, to make sure that furnace parts FIT.

We don't just take furnace parts out of a bin and ship them. Every PREMIER Furnace is factory assembled and all parts accurately hand fitted. Then parts are numbered, packed together, and the entire furnace shipped as a unit.

This extra care and effort to insure low installation cost is typical of PREMIER interest in the success and prosperity of its dealers. Perhaps it would pay YOU to inquire about the PREMIER Dealer Franchise.

Premier Furnace Co.
Dowagiac, Michigan

PREMIER *The Year' Round Line*

There is more than meets the EYE . . . . . in BUYING BLOWERS

In selecting a blower consider not only engineering features and construction of the blower itself, think also of the reputation of the company from whom you purchase it. With materials short, have they been fair in their allocation? Have they done their level best to hold prices down and maintain your profit? Have they been co-operative and helpful in emergency situations and on special developments? You will find these added values, beyond the merchandise itself, when you buy from Brundage. Brundage offers you the combination that assures complete customer satisfaction; the best engineered blower available today, fine workmanship by craftsmen who know how to be careful, and fullest cooperation. When next you think of blowers remember, Brundage Is A Better Buy.

THE Brundage COMPANY

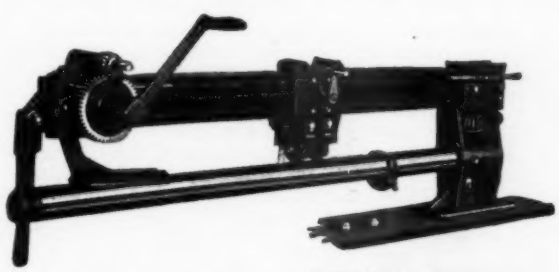
Blower Specialists Since 1919

501 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN

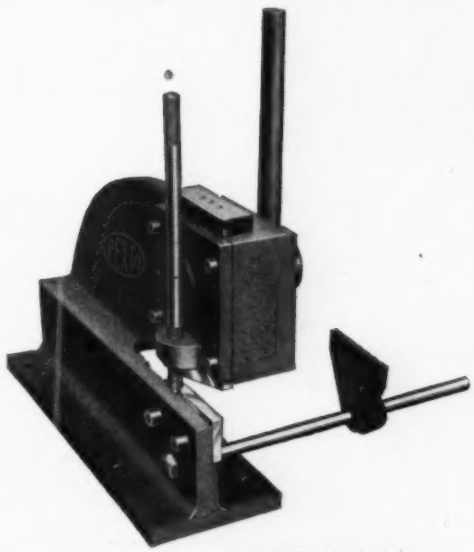
YOUR BUYING JUDGEMENT IS PROVEN *with* PEXTO PERFORMANCE

Fabricating of Sheet Metal requires rugged Machinery that can take a beating and still be accurately responsive to operator control . . . for years of continuous production.

Records prove that PEXTO equipment justifies its selection . . . returns generous profits on the investment.



GROOVING MACHINES



SLITTING SHEARS

THE PECK, STOW & WILCOX COMPANY *Since 1785* SOUTHINGTON, CONNECTICUT, U. S. A.

Fiberglas Mop Yarns*

IN READY-MADE MOPS
OR FOR
YARN REPLACEMENT

Now you can get Fiberglas advantages in ready-made mops (names of manufacturers furnished on request) or in skeins for replacement. There's a size to meet your needs.

Fiberglas Mop Yarns won't char, burn or rot—*last up to 15 times longer* than organic yarns. They "thaw out" in two or three minutes after previous uses—and won't catch on fire when left on the job.

Get complete information on these easier-to-use, moneysaving mops and yarns now. Write: Owens-Corning Fiberglas Corp., Department 930, Toledo 1, Ohio. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto, Canada

OWENS-CORNING
FIBERGLAS
Reg. U.S. Pat. Off.

MOP YARN

***Fiberglas is the trade mark (Reg. U. S. Pat. Off.) of a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.**

With the Manufacturers

With the addition of Plant 2 for the sole purpose of blower assembly manufacture, including their component parts, the Brundage Company of Kalamazoo, Michigan is now in full scale production.

New methods of production which will cut costs yet maintain quality and efficiency are constantly being developed and tested under the direction of Joe Brundage, plant manager in charge of production. A captain in the armed forces, Joe was assistant works manager in charge of production control at the army's cannon arsenal, Watervliet, N. Y. and as such it was his duty to work with the Methods Supervisor in breaking bottlenecks involving most critical war materials.

Treasurer and assistant general manager is another World War II army captain. F. Ward Brundage returned from four years of service which included action as a battery commander, operations officer, and battalion executive officer in France, Belgium and Germany.

War veterans hold key positions in the Brundage Company. Wilden A. Rockafield, vice president and chief engineer, who has been with the company since 1923, is a graduate, M. E., of Purdue university and is a veteran of the first World War.

The company has announced that it is expanding its line to include single width inlet exhaust blowers for ventilating purposes. These blowers, suitable for connecting directly with duct work, will be distributed through the regular channels. Jobbers can now handle inquiries from dealers having to do with ventilating problems.

THE BARNES BETTER BILT GAS FLOOR FURNACE

The BARNES BETTER BILT GAS FLOOR FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace-size—then presto! it goes in easily and with a minimum of muss or fuss.

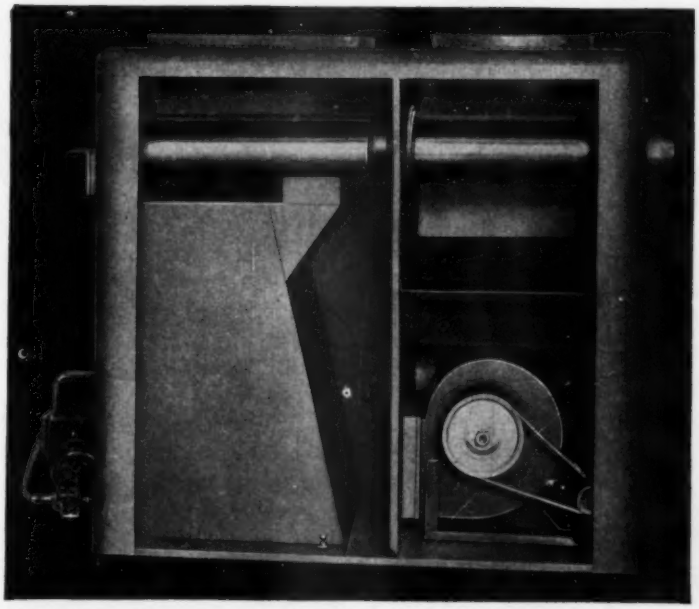
And there are other important, money saving reasons why the BARNES BETTER BILT GAS FLOOR FURNACE appeals to so many builders. There's the heavy 16 gauge heating element—the slotted Port Bunsen type burner—the 26 inch overall depth which requires no pit, no basement—the new, neatly designed non-vision grill—the fact that it meets the latest rigid requirements of A. G. A. standards for safety, economy and efficiency—and the ten year guarantee that insures your investment.

GAS 'Barnes Better Bilt' FURNACES

For further information on the Barnes Better Bilt Gas Floor Furnace write today

BARNES HEATING & VENTILATING CO.
SALES OFFICE 330 E. FOURTH ST. LONG BEACH 2, CALIFORNIA

Presenting the "SILENT"



275-gallon, 14-gauge fuel oil tanks available with units.

STEEL-WELD *Oil Burning* WINTER AIR CONDITIONER

A modern automatic heating plant for your most discriminating clients. Features keen beauty and smooth performance skilfully engineered to provide maximum comfort. The "Silent" is a real money-maker for aggressive dealers.

Please write for literature.

MANUFACTURED BY **JACOB BRENNER CO.**

FOND DU LAC WISCONSIN

Summer or Winter

IT'S BURDEN BLADES

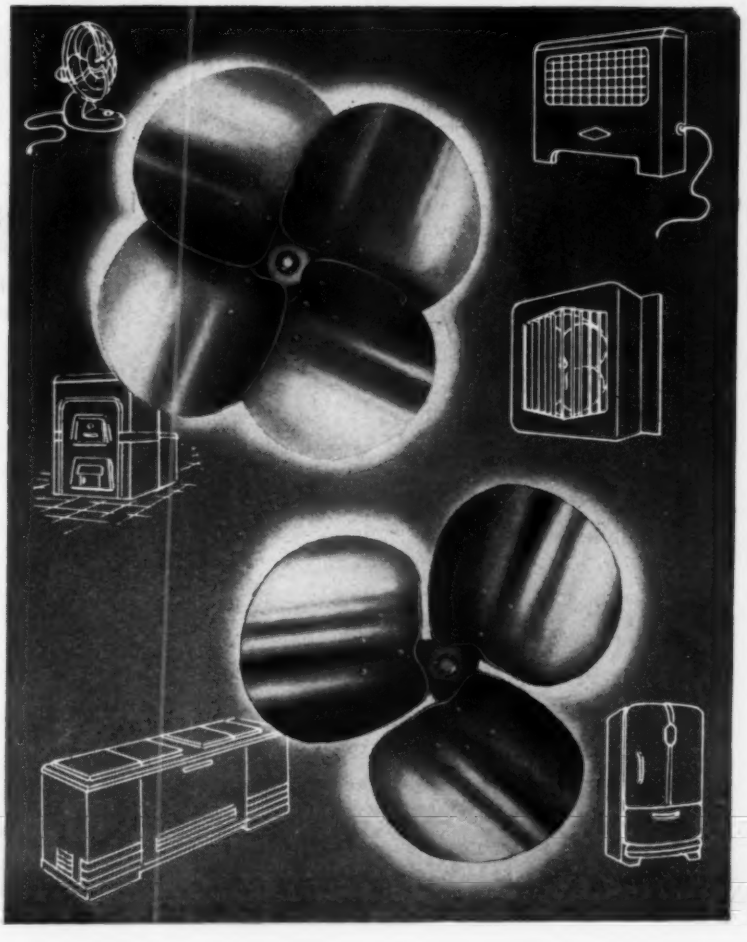
The Blade that's Electronically Balanced

WHETHER for breeze fans, refrigerators, air conditioners or forced air heaters, manufacturers have found Burden Blades meet rigid requirements.

Burden Blades are made of aluminum for light weight and less horsepower consumption. They're highly polished for attractiveness. They are quiet, smooth running, efficient. And they are perfectly balanced by the new Burden electronic balancer that assures the qualities you demand in better impellers.

Whatever your impeller need — for summer or winter — use the scientifically balanced Burden Blades.

Write Today for Literature

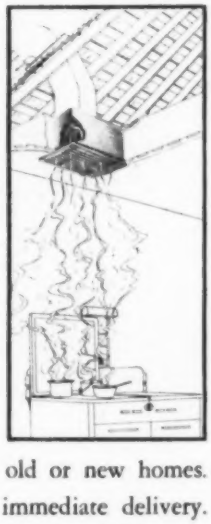


burden COMPANY

1000 N. ORANGE DRIVE, LOS ANGELES 38, CALIFORNIA

Canadian Representative: SILVER BROTHERS CO.
7-11 Mary Street Hamilton, Ontario

Show the housewife how easy it is to keep her whole house clean and fresh with a Clipper installed in her kitchen! This is the magic sales story that is paying bigger profits to dealers everywhere. Are you cashing in on it, too?



The Clipper is a complete, packaged ventilator which is easily, quickly installed. It is mounted in the ceiling between joists and vented outside—it traps and expels unwanted heat and odors the instant they rise. Unlike any other equipment, the motor in the Clipper is entirely removed from the airstream—away from all contaminated air. This means greater efficiency, longer life and easier servicing.

Effective in any small room—in old or new homes. Clipper blowers are available for immediate delivery. Write us for the special bulletin which explains how simply the Trade-Wind Clipper Blower can be installed in old as well as new houses. You will also receive details of the Cooperative Dealer Plan.

TRADE-WIND MOTORFANS, INC.
5703 SO. MAIN ST., LOS ANGELES 37, CALIF.

Kruckman Washington Letter

(*Continued from Page* 61)

per ton he managed to buy 30 or 40 tons of Republic Steel products from one of its jobbers at the price of $230 per ton. Said Mr. Foerstner: "I am quite sure some manufacturers who are receiving steel find it more profitable to sell steel at these excessive prices to warehouses and to other manufacturers than to produce their own products."

It was Mr. Foerstner who gave the committee a graphic picture of the practices which have enabled some of the daisy chain operators to get steel. He explained that certain jobbers purchase ingots at a cost of approximately $70 to $75 per ton. They take the ingots to the steel mill. The mill either credits the ingot or buys them direct at the price of $32 per ton. The mill then sells the jobber the steel at the regular price up to 70 per cent of the amount of the ingots the mill has purchased. This gives the jobbers or the warehouses the steel.

Deputy Housing Administrator Robert E. Johnson made a particular complaint about the practice of the steel mills in withdrawing from certain areas where their product had been the basis for the supply of a large part of the industry which manufactures steel goods. He mentioned specifically the Bethlehem Company, which had withdrawn from the Michigan-Minneapolis area. "I think," said Mr. Johnson, "the Bethlehem Company feels in the Michigan area that

XX BLAST THAT FURNACE MAN WHY DIDN'T HE SET OUR FURNACE WITH THAT GOOD "GRANT WILSON" FURNACE CEMENT!
Guard that
ZONE
COMBUSTION
ZONE

No, Sir—when Grant Wilson Furnace Cement is used they won't need a Gas Mask—for this smoke tight and gas tight cement holds those furnace joints together in the "Combustion Zone" perfectly.

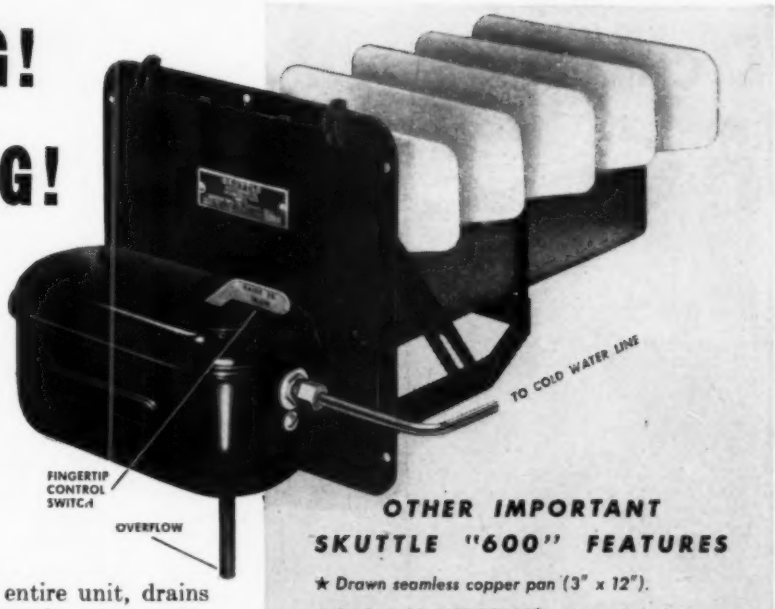
Furnace Men like to use this easy to apply high quality acid proof "Grant Wilson" Furnace Cement—Write today to GRANT WILSON, INC.

Insist on it *Your Jobber has it*

141 W. JACKSON BLVD. CHICAGO 4, ILLINOIS

Self FLUSHING!
Self CLEANING!

AUTOMATIC CLEANING NOW POSSIBLE IN THE NEW SKUTTLE HUMIDIFIERS



IT'S TRUE! Skuttle Automatic Humidifiers (Series 600*) are completely self-flushing, completely self-cleaning! All you do is raise the fingertip control switch to flushing position and Skuttle's new exclusive vacuum-controlled cleaning system does the rest . . . flushes the entire unit, drains off all water, sludge, mud and mineral deposits, then automatically trips off to allow unit to refill again to valve adjustment level! No hand scraping required, no clean-out panel necessary! Simple, convenient, foolproof!

*Patents Pending

OTHER IMPORTANT SKUTTLE "600" FEATURES

- ★ *Drawn seamless copper pan (3" x 12").*
- ★ *Replaceable VAPOGLAS* evaporating plates.*
- ★ *5 plates furnished. Evaporating area 316 sq. in.*
- ★ *Automatic anti-siphon float control valve.*
- ★ *Collar fits sloping or vertical bonnets.*

See your local jobber or write today for state listings and the complete Skuttle story!

Skuttle MANUFACTURING CO.
4099 BEAUFAIT, DETROIT 7, MICHIGAN

★ ★

Available for IMMEDIATE DELIVERY!

FURBLO COAL AND OIL BURNING WINTER CONDITIONING UNITS IN FOUR SIZES FROM 105,000 Btu. to 190,000 Btu.

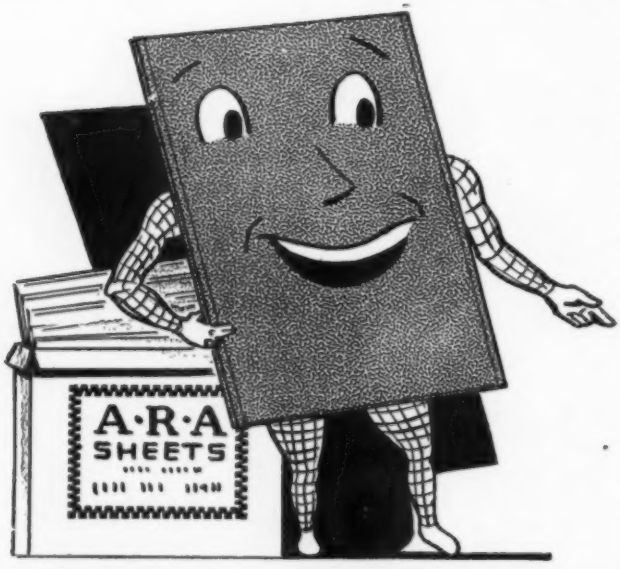
COAL FURNACES PROVEN TO BE EFFICIENT AND ECONOMICAL FOR CONVERSION TO OIL OR GAS

WRITE US TODAY FOR MORE INFORMATION.

FURBLO CO.
HERMANSVILLE MICH.

★ ★

Don't be FOOLED



A. R. A. SHEETS for COLD AIR RETURNS *are Better!*

USE A.R.A. SHEETS for cold air returns—for they are successfully designed to keep COSTS down and do a real job besides.

As you know one man can easily handle these uniform and rigid sheets that are just the right size to cover the joist spaces perfectly—furthermore these substantial moisture repellent sheets absorb noise and insulate—all at the same time. (K. .45 B.T.U.)

A.R.A. sheets give that trim finished look with their soft neutral color with no glare. Buy the "tried and proven" cold air return sheets—millions of square feet are in use and have been for years.

Buy the sheets that lay flat and stay clean looking—they don't buckle or twist—rust or look conspicuous on the ceiling.

CARTON CONTENTS

20 sheets 33" x 48" Per Carton

SHIPPING WEIGHT

Approximately 100 lbs. Per Carton

Get *Genuine* A-R-A Sheets from your Jobber.

WRITE TODAY FOR THE FREE 16-PAGE ILLUSTRATED BOOKLET NO. 91-A

GRANT WILSON, INC.

141 WEST JACKSON BLVD. AT LA SALLE ST. CHICAGO 4, ILL.
(22nd Floor, Board of Trade Bldg. Phone Wabash 8220)

Inland, Carnegie, Youngstown and some others, who are producing nearer to that area, have enough capacity to cover the area, and that they should have the ability to carry that area permanently. Freight rates play some part in the desire to shift markets." Herbert J. Kutz, of the St. Louis Boiler & Equipment Co., gave a graphic description of the manner in which the steel was obtained through the "daisy chain." He told the committee he had never received any steel directly from a mill. The steel obviously came from Inland, at Indiana Harbor, and was shipped to David L. Wilkoff, who was described as a large steel *exporter*. Kutz was told by Wilkoff that Wilkoff was obliged to spend between $300,000 and $400,000 on ingots before he could secure the steel. The questions by the members of the committee and its staff indicated that the steel involved in this transaction was at least in theory destined for export.

See Your Dentist for Steel!

Augustus C. Studer, receiver of the Stangard-Dickerson Corp., Newark, N. J., told the committee in order to keep the plant operating, he was compelled to pay $121,273.99 for 753.31 tons of sheel steel, the first half of this year, which should have cost him $56,498.25 at the average mill price of $75 per ton. He gave it as his opinion that he considered the steel allocation program reasonably fair, but that the distribution is not supervised by the mills with that degree of care which the interests of industry would dictate. He said he had been offered a quantity of steel by many self-styled brokers, *among them a dentist*. Studer asserted

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

49" - 20 ga.
BRAKES
BENCH or FLOOR MODELS
FOR STRAIGHT BENDING OR BOX FINGER WORK

Write for Literature

No. 4 ANGLE IRON SHEAR
CAPACITY 2"x2"x¼" ANGLES
WEIGHT—42 LBS.
A "Must" tool where angle iron is cut—in the shop or on the job.

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

SELL THE FRONT RANK
BLOWER-FILTER UNIT
AND YOU SELL THE
BEST!

CIRCULATES
WARM CLEANSED AIR
IN WINTER...
FILTERED COOL AIR
FROM BASEMENT IN SUMMER

IT HAS THE ADVANTAGES...

. . . easily attached to
SQUARE or ROUND FURNACE . . .
Old or New . . .

Meets present day demand for improved heating efficiency in winter and for "beating the heat" in summer. The important fact that this Unit is compact and easily adaptable to any type furnace new or old, and unusually low-priced for installing in smaller dwellings, makes it the Unit to recommend to customers—with volume and profits for yourself.

Note its superior design:

- Large door gives easy accessibility to motor and filters.
- Filters air from basement for summer cooling.
- Has automatic cut-out motor.
- Top motor mounting.
- Bearings and motor rubber-cushioned.
- Filter frames leak proof.
- Low speed—high pressure. Less noise. and vibration.
- Comes in 5 sizes.
- Low priced.

This Unit is now better than ever—for bigger than ever profits for you.

ORDER From Your JOBBER

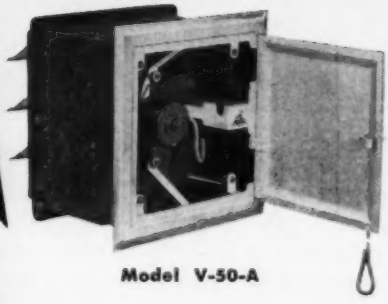
FRONT RANK FURNACE CO.
DIVISION OF LIBERTY FOUNDRY CO.
2500 OHIO AVE., ST. LOUIS 4, MO.

SIGNAL
MANUFACTURERS OF ELECTRICAL PRODUCTS

Exhaust fans

For commercial use—in kitchens, laundries, taverns, garages, and similar installations where a large volume of air is required, Signal Bucket Blade Exhaust fan does the job efficiently, quietly, and economically . . . high grade ball bearing motor, built into fully enclosed housing, motor equipped with adjustable conduit box . . . popularly priced. Write for complete details.

VENT FANS



Model V-50-A

Signal kitchen vent fans are two types adjustable—6-11½"; 13-24" . . . 10" quiet type fan . . . motor rubber mounted — totally enclosed . . . double protection outside shutter; inside door . . . can be installed in new or old houses.

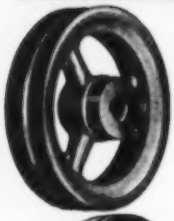
Write for complete catalog information.

ELECTRIC DRILLS

Signal portable electric drills in models for light and standard duty. OB-4 ¼" drill illustrated, has abundance of power developed by a smooth-running universal motor . . . is well balanced, with a comfortable grip and air-cooled handle. In addition, OB-8¼" drill for light duty, and OB-5 standard duty ¾" drill has everything expected in a good drill — power, proper speed, correct balance, high quality construction. Ask for drill catalog and price information.

OB-4—¼"

SIGNAL ELECTRIC MFG. CO.
MENOMINEE MICHIGAN



MAUREY V-PULLEYS

provide a L-O-N-G step toward TROUBLE FREE Performance

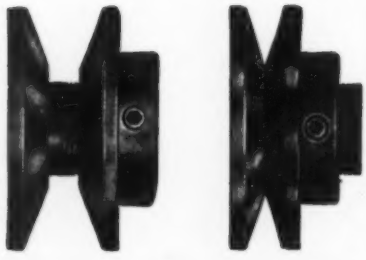
Our long experience in designing and manufacturing V-Pulleys, our complete understanding of their uses, and the finest materials—all are combined in making Maurey V-Pulleys the very best Pulley installations for Refrigeration and Air Conditioning systems as well as for Fans and Blowers.

For unfailing, continuous operation be sure to specify Maurey V-Pulleys.

MAUREY MANUFACTURING CORP.

2915 South Wabash Avenue

CHICAGO 16, ILLINOIS



he is certain the mills do not help to guard the distribution and do not care if it does not go into production. He pointed out that much tonnage is in the hands of junk dealers as well as dentists and others who have absolutely no connection with steel, and suggested that it is apparent there is some gross irregularity in the flow of the steel between the mills and the ultimate consumer. John Vernon Quarles, associated with Mr. Studer, recited an instance of grey market trading made necessary because it would have been impossible to operate without paying the high prices. Said Mr. Quarles: "I had to buy this steel at $240 per ton. I sent a man to Hoboken, N. J., to inspect that steel. He walked two miles through snow up to his knees to see it. He located the car and found the steel wrapped in heavy paper for export. The steel was bound with heavy steel strips with the name of the Inland Steel Co. on the strips. He reported the steel was fine, that he could use it and wanted it. So I communicated with Mr. Kutz. Mr. Kutz directed me to be at the Guaranty Trust Co. in New York with a check. I arrived at the appointed time. Mr. Kutz was not there. The bank communicated with him and said they would not release the bill of lading until he gave written instructions. Their instructions required such action. I waited for Mr. Kutz, and eventually he arrived, signed the necessary release, and I went back to Newark with my bill of lading, very happy, happy that I did not have to recommend the closing of the plant."

Types of Home-Buyers

Federal Housing Administration made the interesting statement that the majority of small-home buyers

QUIET OPERATION

WITH THE

Am-Pe-Co Unipack Blower

"Quiet as a Cat's purr"

Furnace blowers are much the same in construction and operation and it takes painstaking attention to detail to manufacture one that really stands out. We've been making the Unipack Blower to the same consistently high standards since 1929, it is, in fact, custom made, since we do not use mass production. Unipack Blowers will install with a minimum of difficulty and will operate for many, many seasons at top efficiency and with the very nearest approach to absolute silence. Two quickly removable service doors permit ready inspection as well as changing of filters. It's really "quiet as a cat's purr" and a little investigation on your part will convince you of it's sales possibilities. Please write us today for literature.

American Machine Products Co.

MARSHALLTOWN, IOWA

FOLLANSBEE

SEAMLESS TERNE

ROLL ROOFING

Roof repair and replacement contracts will show a satisfactory profit margin when you install Follansbee Seamless Terne Roll Roofing because you will be taking advantage of the time-saving, work-saving features.

It's true, of course, that we cannot furnish immediately all the material you require but your customers will always wait a little longer when they know you're supplying Follansbee Seamless Terne Roll Roofing.

If your distributor can't fill your orders today, please try again. We, at Follansbee, are sparing no efforts to fulfill your demands.

Stocked, As Available,
by Leading Distributors

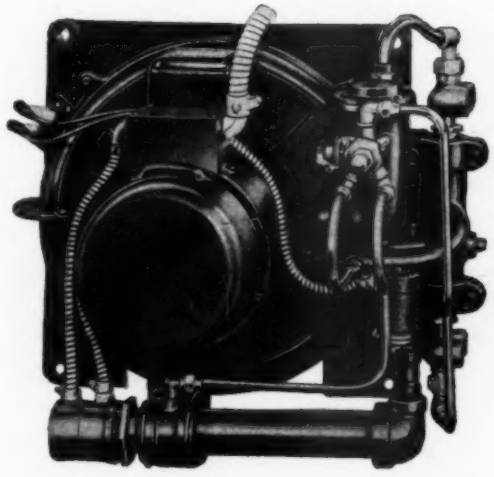
FOLLANSBEE STEEL CORPORATION
GENERAL OFFICES • PITTSBURGH 30, PA.

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va., and Toronto, Ohio. *Follansbee Metal Warehouses*—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

ELECTRICAL SHEETS • POLISHED BLUE SHEETS • SEAMLESS TERNE ROLL ROOFING • COLD ROLLED STRIP

This famous 30 AVH Burner *built by Johnson*

is heating... Hotels Hospitals Skyscrapers Big Buildings *all over the world!*



Johnson's time-tested 30 AVH Burner uses preheated heavy oils that keep fuel bills low. It is built in six sizes and capacities to meet virtually any heavy-duty heating need.

PROBABLY more big buildings have been heated for more years by Johnson's 30 AVH Burners than any other single oil burner model ever built.

For all around efficiency and fuel economy the 30 AVH is unsurpassed. Heating Engineers the world over have learned from happy experience that they can depend on 30 AVH performance. We recommend it for your consideration on any heavy-duty job.

If the 30 AVH doesn't fit your specifications, there are other fine Johnson Burners that will. For the Johnson line-up is a *complete* line-up; small "packaged" domestic burners . . . water heaters of every size . . . air, steam and hot water units . . . and a wide assortment of heavy-duty burners. Tell us what you need. We'll be glad to help you.

There's a Johnson Oil Burner for every heating need

Johnson Oil Burners

S. T. JOHNSON CO.
940 Arlington Ave., Oakland 8, Calif.
401 No. Broad St., Philadelphia 8, Pa.

AIR-FLO MODEL A-555

AUTOMATIC SHUTTER

WEATHER-SEALED

leads the field in features!

FRONT VIEW--CLOSED

There is every reason why you should use AIR-FLO shutters on your jobs. New heavy reinforcement strip adds strength and long life to the louvers, assures quiet operation and perfect counterbalance, prevents rattling. Aluminum louvers open fully, permitting capacity fan operation. Deep shroud protects shutter from high winds. Tie-rod, brackets and bearings inside frame, not exposed to weather. Special finish resists corrosion. Many other features. Write for illustrated catalog 42-C of the complete AIR-FLO line.

AIR CONDITIONING PRODUCTS CO.

2340 W. LAFAYETTE BLVD. DETROIT 16, MICH.

recently were those in the income bracket averaging between $3,000 and $4,000 per year; they bought 19.7 per cent of all homes. Next came those with incomes running between $3,500 and $4,000; they bought 17.6 per cent of the new homes. Those with an annual income of $4,000 to $5,000 purchased 16.3 per cent; those having an income of $2,000 to $2,500 bought 16 per cent; and those with an income between $2,500 and $3,000 bought 15.8 per cent. Those who made the smallest investments in homes recently were the people with incomes of $1,000 to $1,500 and those with incomes exceeding $10,000 per year. Congress itself will spend $100,000 on junkets and jaunts with the avowed purpose of finding out why people are not building more homes. The investigation started with a tough fight between Senator Tobey of New Hampshire and Senator McCarthy of Wisconsin, both Republicans, who sought to boss the job. McCarthy, a freshman, won. He was made vice chairman of the committee. As is often the case in Congress, the difference was largely personal. The men are antagonistic; their chemistry does not harmonize. Consequently, it costs the country money and time.

Building Codes

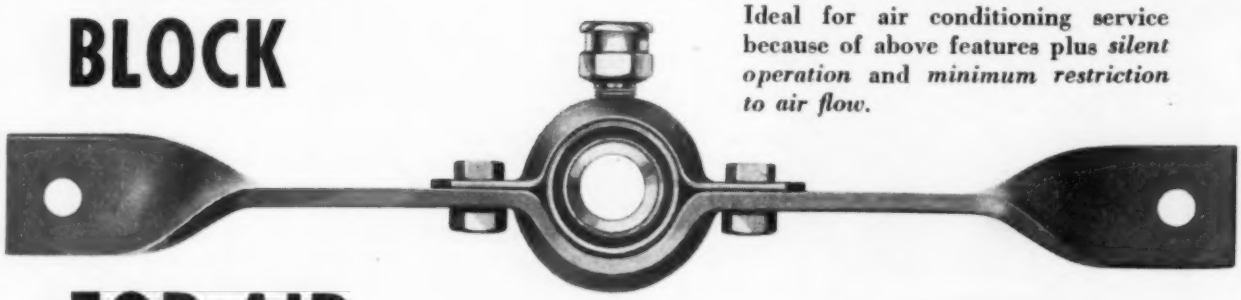
(*Continued from Page* 66)

practice." This seemed to express the thing that they sought to do since they were not setting up minimum standards but those standards which they thought should prevail in the times when there are no material

THE IDEAL PILLOW BLOCK

UNIQUE engineering encloses Bushing, Cushion and Sealed Oil Reservoir in compact pressed steel ball. Perfect self-alignment through ball and socket action. Built-in oilproof synthetic rubber cushion absorbs vibration. Porous bronze bushing, wick fed from large oil chamber, insures long-time lubrication.

Ideal for air conditioning service because of above features plus *silent operation* and *minimum restriction to air flow.*



FOR AIR CONDITIONING

This bridge tree is one of several types of mountings. We are glad to cooperate with engineers in designing mountings to meet their specific needs. Tell us your problems and we will send illustrations, specifications, and complete information.

TRIANGLE MANUFACTURING CO.

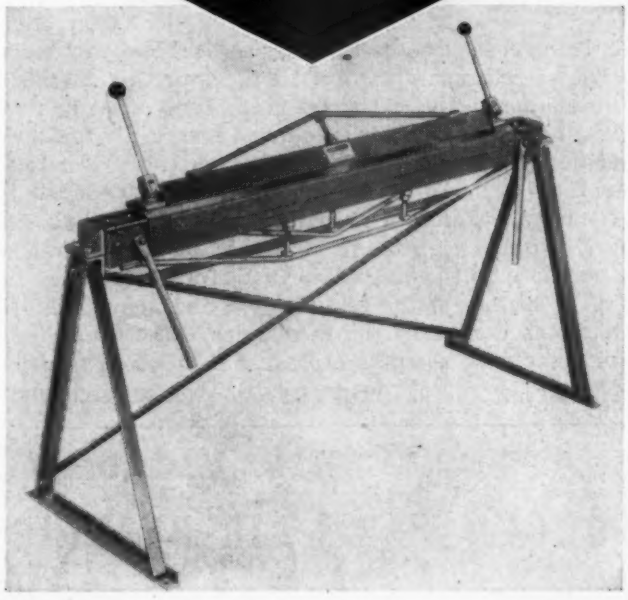
392 Division Street Oshkosh, Wisconsin

Now!

ACCURATE BENDS TO 150°

ON THE JOB or IN THE SHOP

with a WEBCO *PORTABLE* SHEET METAL BRAKE



NOW you can have a sheet metal brake that gives you *double service*—you easily carry it to the job in the back of a car or pick-up truck . . . or, use it in the shop for production work!

Sturdy, all-steel *Webco* Sheet Metal Brakes, in capacities up to 49", make clean, accurate bends to 150°, including "Pittsburgh" bends and 1¾" pan boxes. Finger-tip control of folding bar, utilizing case-hardened cams that transmit hard, even pressure, and special *Webco* design features assure fast operation and consistently sharp bends every time. When cams are released, folding bar lifts automatically . . . can be removed completely for bends impossible to make on fixed bars.

The *Webco* is precision-built, yet is priced so low, is so simple and quick to operate, that it's possible for it to pay for itself on a single job! Ask your supplier today about *Webco* Sheet Metal Brakes—or, write direct for your free copy of Bulletin B-4c.

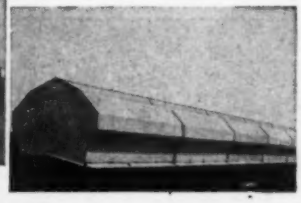
Manufacturers of WEBCO Cold Forming Machinery

WEBB MACHINE & TOOL CO.
IMPERIAL, PENNA., U.S.A.
General Sales Office
206 Coraopolis Trust Bldg., Coraopolis, Pennsylvania, U.S.A.

Quick Easy Way to get more Roof Ventilating Jobs—

install Swartwout Ventilators

These widely advertised roof ventilators have business-getting features that make easy sales and satisfied customers for you. Building owners and occupants pay more attention than ever these days to proper ventilation—and *roof ventilation* is the answer in thousands of cases. Factories, warehouses, garages, airport buildings, and many others are your prospects. Be sure you have the Swartwout Ventilator Catalog handy. Write today for complete information.



And for Residence Construction, Swartwout's Louvers and Roof Ventilators

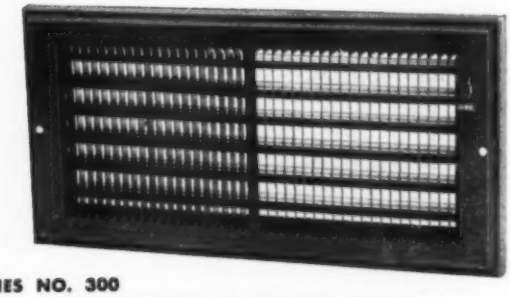
Every insulated house, and many others, is a prospect for your sale of several attic louvers or roof ventilators. Swartwout Louvers made in 3 sizes for new work—5 sizes for old construction. Rugged but light weight. Easy to install; profitable.

The Swartwout Company
18615 Euclid . . Cleveland, Ohio

Swartwout VENTILATION SPECIALISTS

EFFECTO-GRILLE

Beauty and Performance COMBINED



SERIES NO. 300

AIR CONDITIONING LINE

Vertical, Adjustable, Fin-Type
Multiple Shutter Valve

We also Manufacture a Complete Line of GRAVITY REGISTERS and GRILLES.

Where positive control of air flow is required, Series 300 Registers should be used. Popularly priced, it can be used even on the most competitive installations. Prompt attention to all inquiries.

TURNBULL MANUFACTURING AND DISTRIBUTING CO.

9930 Freeland Ave. **Detroit 27, Mich.**

Speed Up Orders With a
BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. FASTER—accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

BEVERLY SHEAR MFG. CO.
3004 W. 111th St., Dept. 5 **Chicago 43, Ill.**

shortages and construction is again an orderly and fairly exact procedure.

There was also some disagreement as to the scope of the code, with some advocating that it be kept within the strict limits of scientific fact and others demanding the inclusion of immeasurable and intangible subjects. In this regard Mr. Lucas says, "I don't think one can exclude traditional practice or even matters of opinion from the scope of a code, but I do feel that it is most important to recognize which is which."

The Association and Codes

Just as a building code is set up to provide uniform practice in the overall construction picture, the National Warm Air Heating and Air Conditioning Association has set up its Codes and Manuals as a means toward accomplishing standard practice in the design and installation of warm air furnaces. These Codes (No. 5—Gravity and No. 7—Forced Air) offer any building code committee the easiest and best way possible of setting up a standard for warm air furnace installations. The committee need simply state in the heating section of their code that all warm air furnace installations must conform to the standards prescribed by the Association in the appropriate Code and Manual (Gravity or Forced Air) or they could include the suggested ordinance form of standards for warm air installations that is included in each of the manuals.

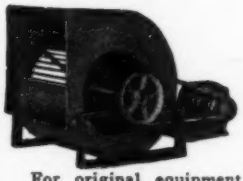
The history of the heating Code and Manual, as it has been evolved by the Association, has been one of industry wide acceptance because it has been flexible enough to reflect developments from research and

For Top-Flight

FORCED WARM AIR HEATING

SPECIFY REX BLOWERS

THE REX BLOWER LINE assures superior service to users because it includes enough models to provide an extra-wide choice of air deliveries (from 400 c.f.m. to 32,000 c.f.m.), each at a number of speeds. Meeting air movement requirements accurately keeps both the initial cost and operating cost of a heating system as low as possible. There's no need to seriously over-power an installation to assure adequate comfort at peak of demand—or grossly under-power one to cut original expense. In the Rex Blower family you can readily find a "happy-medium" model that will give maximum all-around satisfaction. Send for complete specifications and performance data charts today.



For original equipment use, send for Catalog No. 222. For conversion of existing gravity jobs to forced warm air systems, send for Catalog No. 238-A.

Air CONTROLS INC
Div. of
The Cleveland Heater Co.

2310 Superior Avenue **Cleveland 14, Ohio**

Northwestern

presents a new catalog

Here's further evidence of our sincere desire to furnish the finest possible service in filling your orders for repair parts. It's a big, new 85 page catalog listing the thousands of patterns available, and which you may combine with our price list to estimate the cost to you of the many parts listed. It will be an invaluable aid in estimating the cost of jobs, as well as finding parts for heating plants whether new or old. This catalog is yours for the asking, too! Just drop us a line and we'll send one without delay.

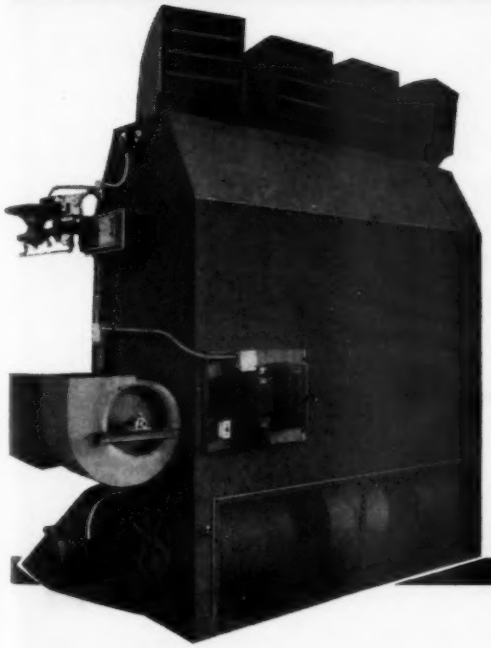
We've always made a conscientious effort to provide the best possible parts and service, and we know we've succeeded because we're enjoying a large volume of repeat business from dealers all over the country. Just remember to try NORTHWESTERN FIRST and ALWAYS and you'll go a long way toward satisfying your customers.

NORTHWESTERN STOVE REPAIR COMPANY

662 West Roosevelt Road **Chicago, Illinois**

AIRTHERM
DIRECT-FIRED WARM AIR HEATERS

Offer You These Six Heating Advantages



1. A complete factory heating unit.
2. Comes to you ready to set in place.
3. Control system wired at factory.
4. Available in floor-mounted or suspended models.
5. Oil burners or gas burners are interchangeable to meet future fuel conditions.
6. Capacities from 650,000 to 1,950,000 BTU per hour.

For detailed information, write for Bulletin 801-A.

AIRTHERM MANUFACTURING CO.

706 South Spring Ave. • St. Louis, Mo.

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LINE UP NOW WITH
ECON-O-COL STOKERS

. . . to cash-in on the huge backlog of stoker sales! You increase your profits through faster sales, make fewer service calls by selling ECON-O-COL's complete line of precision-built, highest quality stokers. And a hard-hitting promotional program backs you up every step of the way! Details of our exclusive dealer franchise, now available in several areas, await your inquiry. Write or wire us today.

ECON-O-COL COAL BURNER
THE SHIELD OF QUALITY

ECON-O-COL
The "Stronghearted" Stoker
BUILT BY COTTA TRANSMISSION COMPANY • ROCKFORD, ILLINOIS

proven practices. At one time a warm air furnace was installed according to the individual ideas of the man who installed it. Naturally this led to a welter of confusion in practice and general lack of uniformity. As a means of setting up standards of practice and design for greater heating efficiency and also to reduce the ever present fire hazard, the National Warm Air Heating and Air Conditioning Association wrote its original gravity and forced air codes. The current codes reflect the advancements through the years and their universal adoption would greatly benefit the public welfare.

Mirabile

(*Continued from Page 77*)

when they come in contact with fuel oil. There are many good tank paints and machinery enamels on the market. While we are on the subject select a color for all tanks, fill and vent pipes, etc. Eventually a dealer can become identified in his locality by the color he always uses to dress up his installations.

To cement all openings and to protect the oil line, always use 2 parts bar sand and one part portland cement mixture. Do not use more water than necessary to get a good putty like consistency. The more water used, the more possibility of the cement cracking and shrinking when it sets. Cement neatly around the fill and vent pipe opening, also over the oil line and around the tank legs if slate, etc., was used to level the tank.

REPAIR PARTS
for . . . STOVES • FURNACES • BOILERS
also
FITTINGS • REGISTERS • SUNDRIES
and . . .
FIVE GREAT LINES
OF HEATING EQUIPMENT
★ ARMSTRONG! ★ MODERNAIRE!
★ LUXAIRE! ★ RYBOLT!
★ JACKSON and CHURCH
YOUR COMPLETE HEATING NEEDS CAN BE FILLED BY BUYING AT—
DES MOINES
STOVE REPAIR COMPANY
SAM C. GREEN
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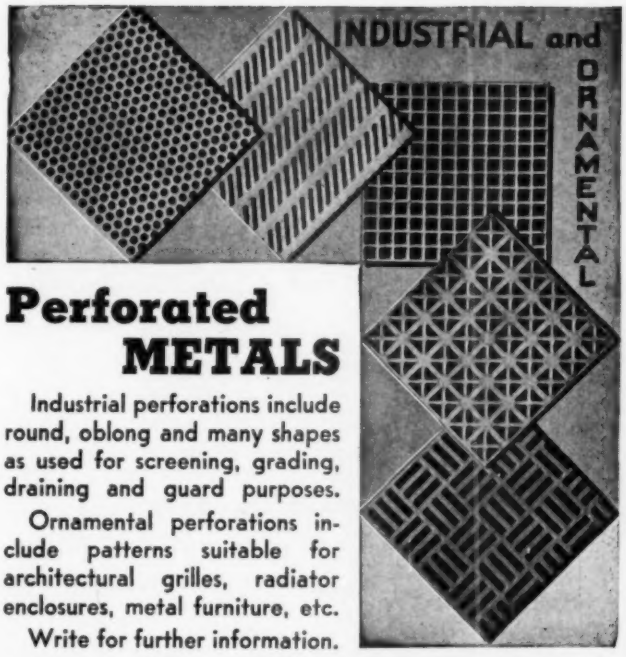
DES MOINES, IOWA
SINCE 1869



Perforated METALS

Industrial perforations include round, oblong and many shapes as used for screening, grading, draining and guard purposes.

Ornamental perforations include patterns suitable for architectural grilles, radiator enclosures, metal furniture, etc.

Write for further information.

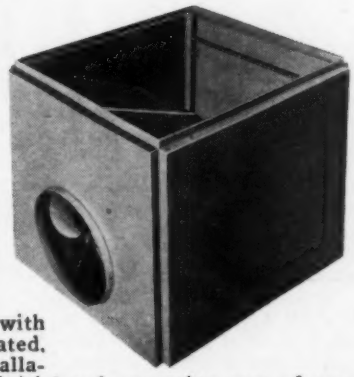
ANY METAL — ANY PERFORATION

The Harrington & King PERFORATING CO.

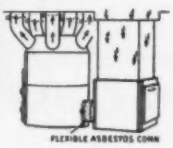
5649 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.

CONVERT HOT AIR FURNACES TO WINTER AIR CONDITIONERS WITH

the Economy FAN FILTER CABINET



Here's an *extra quiet* operating fan filter unit especially designed for converting 18" to 26" gravity furnace installations. Cabinet 27"x27"x28", green baked enamel finish with 25½"x18" service door, two 25"x20" Dustop filters, special heavy duty, non-overloading motor, overlapping pressure type propeller. Shipped completely assembled. Asbestos cloth connection with two metal rings, as illustrated, furnished for easy installation. It has the lowest *initial* and *operating* cost of any similar unit on the market and is the unit you need for more *business* and more *profits*. Write us today for literature.



NATIONAL ENGINEERING & MANUFACTURING CO.

213 West 19th Street Kansas City 8, Mo.

PERFORMANCE PLUS!

ATH-A-NOR Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

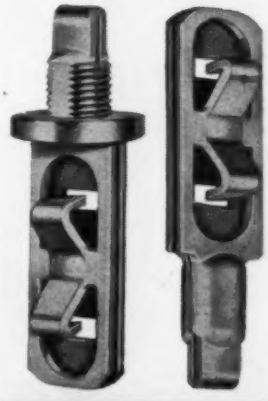
Manufacturers of Quality Heating Equipment for Over Fifty Years.

Newark Ohio

STOP These 3 MAJOR NOISE MAKERS IN SYSTEMS YOU INSTALL

- LOOSE RIVETS
- AIR FLOW STOPPAGE
- UNBALANCED DAMPERS

E-Z-ON DAMPER REGULATORS



Punch Their Own Holes . . .
Rivet Themselves at a Hammer's Blow . . . .
Offer No Air Flow Resistance . . . .

You can practically eliminate noise tendency in mechanical heating, ventilating, or air-conditioning systems by using E-Z-ON Damper Controls.

Stocked in Canada by
THERMIDAIRE CORPORATION LTD.
Long Branch, Toronto 14

M. A. GERETT CORP.

724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

PROMPT SHIPMENT

ANGLE RINGS

ON THE SQUARE

We roll Angle Rings to your specifications accurately with uniform curvature—that join up naturally—including Tees, Channels, Bars and special shapes—with or without rivet or bolt holes.

Saves time and effort when you back them up or fit them in on the job. Made to fit your needs—complete circles or any part thereof.

Used for reinforcing tanks, joining pipe or smoke stacks, installing air conditioning fans, and thousands of other uses.

Write for standard sizes and discounts.

NATIONAL METAL FABRICATORS

136 S. Sawyer Avenue Chicago 23, Illinois

EASY EXTRA PROFITS
on every Automatic-Heat installation

Lowest Cost HOME INCINERATION available!

Majestic No. 30 FUELLESS HOME INCINERATOR

Low cost and "self-burning" action bring quick sales for this easy-to-install incinerator—especially where automatic heating prevents rubbish-burning in the furnace! Burns wet or dry garbage and rubbish; advanced down-draft action dries the waste constantly. Contents need be ignited only once or twice a week; ashes removed only once or twice per month. Unit is only 2 feet in diameter, less than 3 feet high! Uses any 8-inch flue; will not affect heating-plant efficiency if tapped to furnace flue. Handsome silver-and-blue duotone finish! *Write for details!*

The Majestic Co.
842 Erie Street
HUNTINGTON, INDIANA

Nationally Advertised Home Necessities for Over 40 Years.

Rochester Gas Standards

(*Continued from Page* 79)

For Warm Air Installations

Fire Pot Dia.	Recommended Gas Input Cu. Ft. Gas/Hr.	Recommended BTU. Input/Hr.	Dia of Vent Pipe
18	135	72,000	4"
20	165	87,000	5"
22	195	106,000	5"
24	225	121,000	5"
26	275	150,000	6"
28	315	172,000	6"
30	360	195,000	6"

For Steam or Hot Water

Actual Sq.Ft. of Direct Standing Rad. Boiler Will Handle				
Steam	Hot Water	Cu. Ft. Gas per Hr.	BTU. Input/Hr.	Dia. of Vent Pipe
170′	270′	150′ or less	81,000	4"
260′	415′	to 225′	121,000	5"
470′	750′	to 395′	212,000	6"
635′	1,015′	to 525′	282,000	7"
865′	1,400′	to 700′	378,000	8"

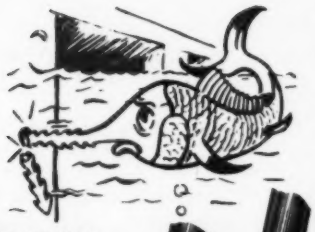
"Made-Rite"

DUCTS
•
SMOKE PIPE
•
FURNACE PIPE
•
FURNACE FITTINGS

You can save yourself time and money and make certain of well-tailored installations by contacting us for your pipe and fitting needs.

We are proud of our reputation and we want to help you fill your requirements with precision fittings . . . MADE-RITE. A postcard to us will bring you more information.

"Made-Rite" Co., Inc.
10th & Monroe St. Newport, Ky.

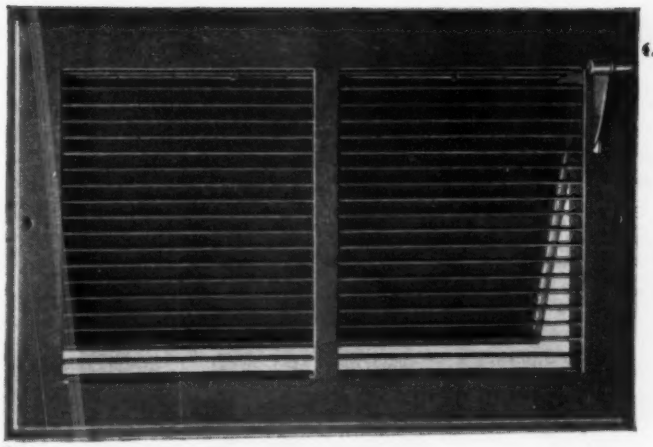


Rotary Joe says:

"THERE'S AN EASIER WAY TO DRILL CONCRETE"

MAYBE you can get a swordfish to bore holes in concrete. But a quicker, easier way is to use Rotary Concrete Drill Bits. Rotary Bits cost more than others, but they last longer and do a precision job. Hand machined from finest material. Fluted to carry off chips. Sizes range from ¼" up, with shafts from 5" to 12". Operate with any power drill. Special designs and sizes on order.

Rotary Concrete Drill Co.
650 South Arroyo Parkway
PASADENA 2, CALIFORNIA



Sidewall Register	#20
Sidewall C. A. Grille	#28
Baseboard Register	#24
Baseboard C. A. Grille	#27
Floor Faces	#50

Nearly all sizes for delivery

MIDCO REGISTER CORP.
1059 Grand Ave. St. Paul, Minn.
Factory Representatives Wanted for Some Territories.

PEERLESS

HAS A FURNACE FOR EVERY NEED

¾ Million B.T.U.'s to the smallest home requirement.

COAL — OIL — GAS
Stoker and Hand Fired.

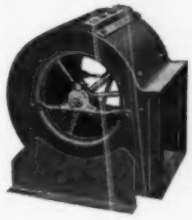
Peerless warm air furnaces have been serving satisfied customers for almost half a century.

Peerless dealers can always depend on getting their share of furnace business with the Peerless complete line of warm air heating equipment.

PEERLESS FOUNDRY COMPANY
1853 Ludlow Avenue Indianapolis 7, Ind.

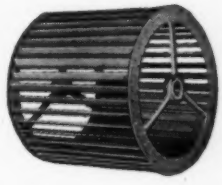
• BLOWERS •

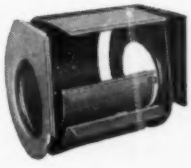
for
Air Conditioning Furnace Manufacturers



The *New* Bishop & Babcock Air Conditioning Blower Assembly Type "AC"—Design 2

The *New* Bishop & Babcock Blower Wheel For Air Conditioning Furnace Blowers





The *New* Bishop & Babcock All Stamped Housing Assembly and Component Parts

Write for Bulletin No. 103

MASSACHUSETTS BLOWER DIVISION
The BISHOP & BABCOCK Mfg. Co.
4901 HAMILTON AVENUE CLEVELAND 14, OHIO

WHITNEY LEVER PUNCHES

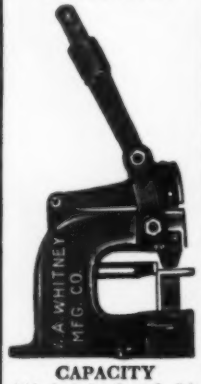
No. 4B PUNCH

Length 8½ inches. Capacity ½-inch through 16 gauge. Deep Throat — 2 inches. Weight—3 pounds. Punches and Dies—1/16" to 9/32" by 64ths.

No. 6 PUNCH

Length—26½ inches. Capacity — ¼-inch hole through 3/16-inch iron; especially adapted for button punching or templet work. Punches and dies 3/16" to 9/32" by 32nds.

No. 91 PUNCH

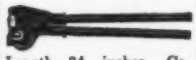


CAPACITY

½-inch hole through ¼-inch iron; ¾-inch hole through 3/16-inch iron; 2-inch hole through ¼-inch iron. Depth throat, 5 inches. Weight, 82 lbs.

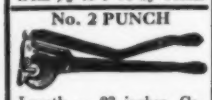
We have tools for every purpose needed by Sheet Metal Contractors.
Ask your Jobber

No. 1 PUNCH



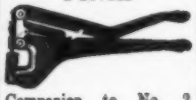
Length—34 inches. Capacity — 3/8 - inch hole through ¼ - inch iron. Punches and dies in sizes from 1/8 to 9-16 by 64ths.

No. 2 PUNCH



Length — 23 inches. Capacity — 5-16-inch hole through ¼ - inch iron. Punches and dies in sizes 3-32" to ½-inch by 64ths.

CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two punches Interchangeable, including punches and dies. Capacity—¼-inch hole through ¼-inch iron.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

The burner must always be sized to the rated capacity of the boiler rather than to the installed radiation.

Vent Pipe Damper

A standard cast iron vent pipe damper shall be provided and installed in vent pipe close to the furnace and ahead of the open end drop-leg as instructed. See sketch.

Heat Pump

(*Continued from Page* 83)

22 refrigerant is circulated. On the chart this is considered the primary radiation. The secondary radiation consists of ⅝ inch copper tubing 24 inches long, welded at right angles to the primary coils and spaced about 18 inches apart. The coils were buried at depths of from three to six feet in three different trenches. At various periods through the winter there was water and ice surrounding part or all of the coils, but at no time was there any evidence that the coils were insufficient for the heat requirements of the house—on the contrary there was evidence that there was capacity beyond requirements. Although in this installation these coils, which delivered a maximum of approximately 60 Btu per lineal foot, proved entirely adequate, it is evident that considerable research and experience will be necessary in order to determine the exact size, design and type of ground coil for each soil condition.

we want

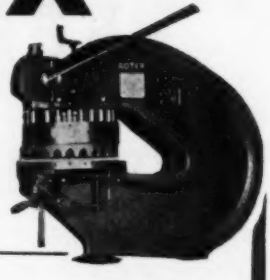
DEALER GOOD WILL

YOUNGSTOWN pipe and fittings for both gravity and winter air conditioning are made with the dealer's installation problems in mind, and are made to those exacting specifications. They will "go in" with the least amount of installer's time and are tight under all conditions because of the care with which they are made.

YOUNGSTOWN FITTINGS FIT!

YOUNGSTOWN FURNACE CO.
627 Marshall Street **Youngstown, Ohio**

ROTEX
QUICKCHANGE PUNCHES



18 TIMES FASTER
Because:

Seventeen punches and 2" nibbling shears are mounted in revolving turret head ready for instant use. Punches range from 5/32" to 2".

THE ROTEX 18

has proved its worth in hundreds of small shops as well as in the huge plants of Douglas Aircraft, Fisher Body, R.C.A. Victor and other nationally known concerns. The Rotex 18 can do a faster, cleaner and more profitable job for *you!*

WRITE FOR INFORMATION

ROTEX PUNCH COMPANY
4726 E. 12TH ST. OAKLAND, CALIF.

FOR USE ON EVERY ROOF

ELATERITE

MINERAL RUBBER COATING

. . . available from

PROIE & COOGAN

There's plenty of roofing business for the aggressive contractor these days. Schools, garages, stores, homes, etc., all present a ready and lucrative market and all can be covered to the same high standards with ELATERITE. Here's a tough, lasting, roofing compound which flows smoothly and evenly, leaving an ebony black coating, completely poreless and water-tight. Elaterite seals all cracks and crevices and is unconditionally recommended for roofs of metal, gravel, or composition.

Write us today for literature and in the meantime look around for these highly profitable jobs. When you get them, we'll supply your needs promptly.

PROIE & COOGAN HEATING CO.

WHOLESALE DISTRIBUTORS FOR INDOOR COMFORT SUPPLIES • ROOFING MATERIAL

6117 BROAD ST. **PITTSBURGH 6, PA.**

MOntrose 9300-01

BUILT For BETTER CLEANING

the GRAND RAPIDS deluxe FURNACE CLEANER

Model of the Doyle Vac-It

Built by men who understand the problems of furnace cleaning, the Grand Rapids Furnace Cleaner has been developed into a highly serviceable unit meeting all the requirements for faster, easier and more profitable cleaning:

DURABLE—COMPACT CONSTRUCTION • LIGHTWEIGHT ALUMINUM HEAD ASSEMBLY • HIGH POWERED MOTOR • 9" DIAMETER ROTARY FAN • LARGE CAPACITY HEAVY DUTY STEEL TANK • FLEXIBLE RUBBER CLEANING HOSE WITH 2" INSIDE DIAMETER • EFFICIENT OUTSIDE FILTER BAG • FREE ROLLING SWIVEL-TYPE CASTER WHEELS • ENGINEERED FURNACE CLEANING ATTACHMENTS.

Write today for complete information

Doyle VACUUM CLEANER CO.

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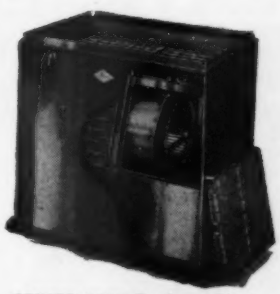
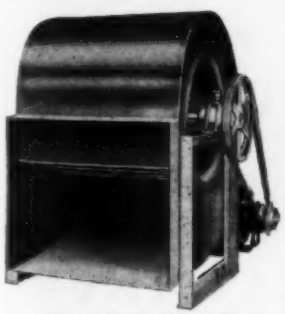
Properaire BLOWERS

EXHAUSTERS and FANS

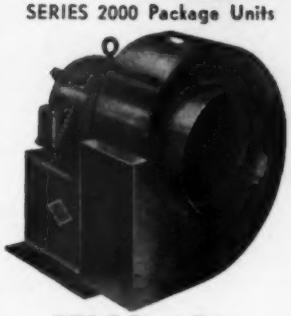
Easily adapted, high quality air moving equipment at attractive, reasonable cost.



SERIES 2000 Package Units



"B" ASSEMBLY Belt Drive



TYPE E Direct Drive

Built for the HOME and OFFICE, and for STORES, FACTORIES and INSTITUTIONS.

Ask Your Jobber or Write for Complete Descriptive Information.

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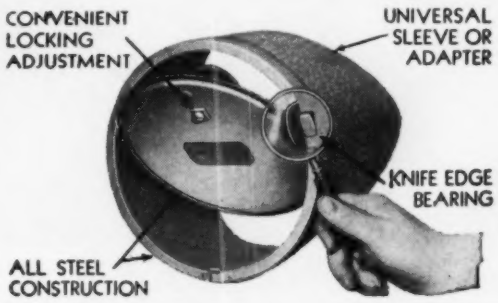
With C.S.E. Barometric Controls

DRAFT KOREKTOR



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A precision built, low cost draft control for coal or oil installations. Highly efficient, providing close control for greater fuel savings. Sensitive balanced blade holds draft to ideal minimum. Two sizes with universal sleeves. Easily installed. For standard pipe sizes from 7" through 12".

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RESULT OF

Scientific Construction

Metalbestos is the only patented vent and flue pipe designed and used exclusively for gas appliances. Ordinary vent and flue pipe has heavy, cold walls which absorb the heat, condensing burnt gases. Metalbestos has been specifically designed to eliminate the formation of this condensate. This has been accomplished with a "pipe-within-a-pipe" construction which provides an insulating air space between the pipes. With the temperature within the air space hotter at the top of the run than at the base, Metalbestos efficiently carries off hot gases before they condense.

EFFICIENT
SAFE • DURABLE
EASY TO INSTALL

METALBESTOS

WILLIAMS-WALLACE COMPANY

160 Hooper Street • San Francisco 7, California

TABLE VII

Method of Estimating Approximate Heat Loss Per Hour in Residential Buildings

Design Range Maximum Temp Difference in Degrees	Btu Required per hr per Cu Ft* Thoroughly Insulated House	Moderately Insulated House	Standard Construction House
100	4.5	6.25	8.75
90	4.0	5.6	7.9
80	3.5	5.0	7.0
70	3.0	4.4	6.1
60	2.6	3.75	5.25
50	2.2	3.1	4.4
40	1.75	2.5	3.5
30	1.3	1.9	2.6

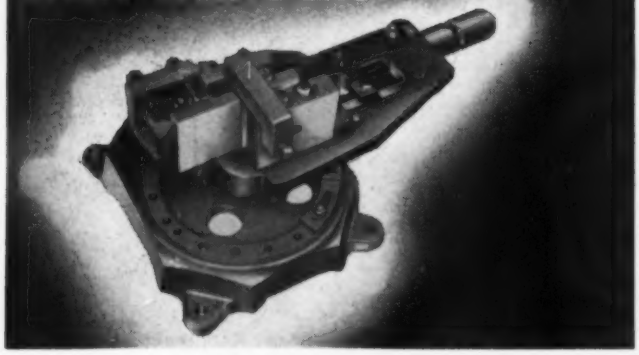
1. Thoroughly insulated house has storm doors and windows, insulated ceilings and side walls.
2. Moderately insulated house has storm doors and windows and ceiling insulation.
3. Standard construction has no special insulation of any kind.

*This should include basement.

Table VII gives a quick method of estimating the approximate heat loss per hour in a residence. By its use as a supplement to the calculation chart, the salesman only needs to know the cubical contents of the building to be heated and whether it is insulated either moderately or thoroughly, or not at all. A more accurate heat loss figure may be determined by using the ASHVE method and probably should be done.

Any consideration of the heat pump as a load building appliance should include some idea of its market

Presenting the **JK** *No. 4*
BAR BENDER



The complete JK Bender line is known for matchless quality and construction. Typical is the JK No. 4 Bar Bender, especially adapted to the needs of manufacturers, builders and contractors. Available in a complete range of styles and sizes, JK Benders are capable of producing a wide variety of shapes. They are easily set up for either hot or cold bending.

If you have a bending problem, be sure to specify JK always. They assure years of trouble-free, profitable performance.

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with the POWERFUL, PORTABLE

TORNADO

FURNACE AND BOILER CLEANER

Such suction! Draws out soot and dirt in a quick, steady stream into tight, over-size bag. Fast, thorough work on every job with attachments furnished. Instantly detachable motor-fan unit becomes a powerful portable suction-blower combination for convenient cleaning of registers, radiators, air intakes, pipes.

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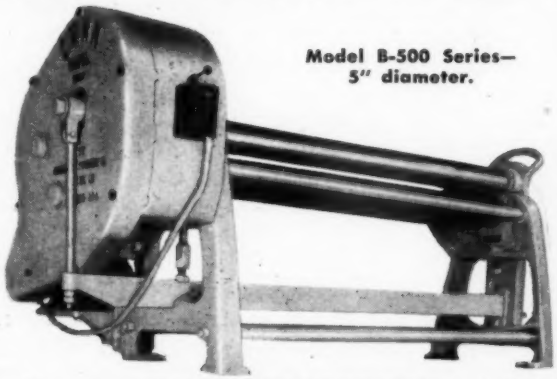
FIT YOUR JOB!



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The "Master" Mark on temperature controls means greater comfort . . . longer life . . . more efficient service for your customers . . . easier sales for you.

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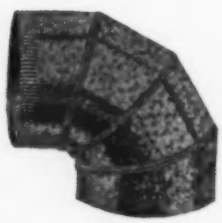
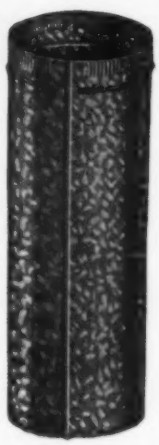
WARM AIR PIPE and FITTINGS



Warm air pipe and fittings are very important parts of your furnace installations, and the difference between a good job and a bad one is often determined by the kind of pipe and fittings used. Don't take chances on bad customer recommendation . . . install fittings from Ralph Supply and make your jobs *good* from the start. We make an honest effort to supply the finest obtainable parts, they'll FIT the first time, they're dependable and competitively priced. Write us today for more information on our complete line of warm air pipe and fittings . . . we'll send literature at once.



RALPH SUPPLY, INC.
P. O. Box 188 Wadsworth, Ohio

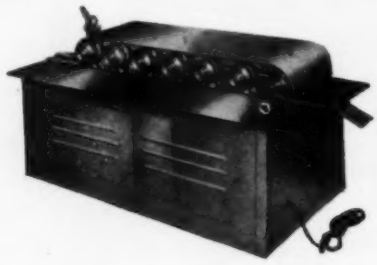
potential, although an attempt to gauge the market for an appliance with an unknown price, and not even available as yet for sale, is "stepping in where angels fear to tread"—particularly if attempted on a national scale. However, a market analysis of the area served by our company may be interesting—even if it is not applicable elsewhere. This analysis covers five years because, after weighing all the factors, this appeared to be the most logical period.

Perforce, our analysis contains a good many assumptions. To start with we are assuming that a unit will be available within the next twelve to eighteen months in fair supply and at an installed price not too far above the cost of other types of automatic heating equipment and considerably lower than the combined price of two automatic units—one for heating, and one for cooling and air conditioning. The material cost alone of the Webber unit was about $500. This may constitute a slim clue as to the cost of a unit of comparable size, produced on a commercial scale.

Operating costs will have some effect on the number of units sold but we do not feel that this is a major point of sales resistance, considering the tangible and intangible advantages which the heat pump brings to the home.

The first step of our analysis was to decide the class of home which could reasonably be considered as a heat-pump prospect. We decided that it would be a home valued at $9,000 and up at 1947 prices. New homes of this class, whether owner-occupied or rented, we believe will be heat pump prospects. Rental prices will be adjusted, if necessary, to provide heat pump

SHEET METAL MACHINERY



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Made in sizes up to 60 in. throat, 10 gauge capacity

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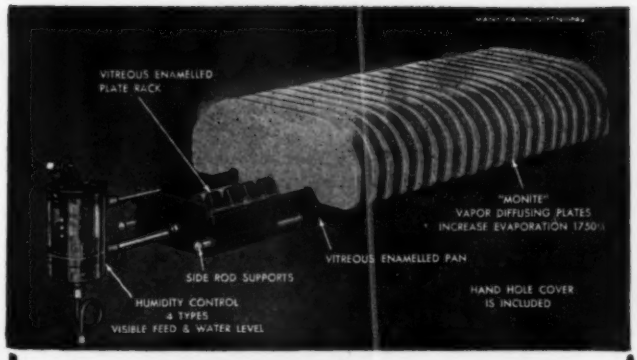

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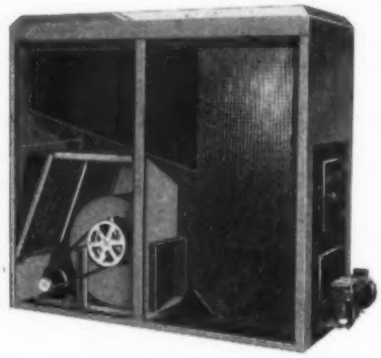
HEATCRAFT COMPANY

VAUGHAN BLDG., LOUISVILLE, KY.

service which the renter will demand, but among existing homes the prospects will be confined chiefly to those that are owner-occupied.

According to the 1940 Census there are, in the area served by our company, approximately 8,550 owner-occupied homes which, at today's price, would be valued at $9,000 and up. In addition the local building industry estimates that about 3,500 homes will be built per year, within our service area, for the next five years or longer and that 60 per cent of these, or 10,500 will cost $9,000 and up. This gives a total of 11,355 heat pump prospects, including both existing and new homes.

We believe it is conservative to expect that, of these prospects, 10 per cent of the existing homes, or an aver-



Dealer profits depend on sales. Sales, now-a-days, depend largely on freeing the customers mind from worry over fuel shortages. That's why we say—investigate this radically new Vapor-Oil furnace,—easily convertible to gas or coal—yes, and even wood if occasion demands.

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"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

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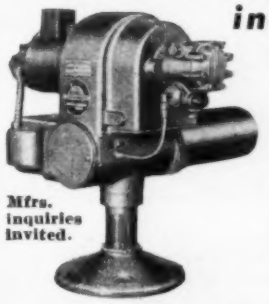
in designed units
with HOWELL
CONTROLLED FLAME BURNERS



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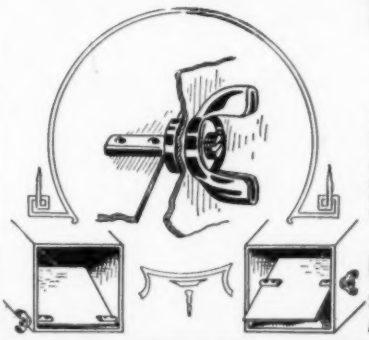

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SPOT WELD WITH ACME "Hot Spot" WELDERS

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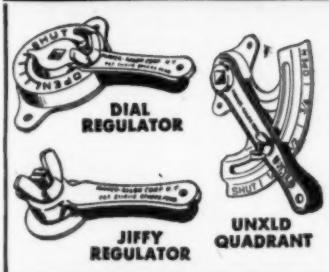
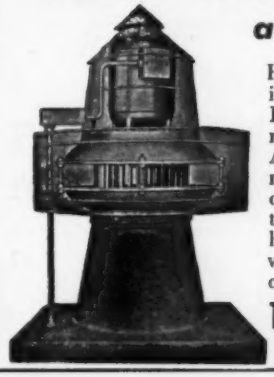


For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 200 Varick Street, New York.

PARKER-KALON damper controls

MOVE 30% MORE AIR

at less power cost!



Here's a new idea that revolutionizes ventilating . . . the Air-Van Power Exhauster moves 30% more air at less power cost! Accepted everywhere for its phenomenal performance, superior design and splendid construction, the Air-Van Power Exhauster is your answer to all ventilating problems! Write for complete details today.

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Remind that home owner it takes time to get new grates, pots, parts for the furnace. Also higher coal prices can be offset by a cleaner, more efficient heating plant. Folks who put it off all summer are ready now. Clean that furnace with a Super Red Streak the quick easy way. Try a Super 5 days free if you doubt.

National Super Service Co., Inc.
1944 N. 13th St., Toledo 2, Ohio
National Super Service Co. of Canada, Toronto, Vancouver

age of 2 per cent per year, and 25 per cent of the new homes, or an average of 5 per cent per year, will purchase a heat pump. This would mean 3,480 heat pump installations in the five-year period, giving a saturation of 2.5 per cent of the then total residence customers on our lines.

We estimate the year around operation of the heat pump in our locality will average about 9,000 kwhr. Multiplying this by 3,480 units would add an annual increase of 31,320,000 kwhr for heat-pump services. This is equal to 17.4 per cent of the total residence kwhr sales in 1946. This is a good start toward that goal we heard so much about a year or two ago—that the utilities should double the average domestic use in five years after the war.

Neubecker

(*Continued from Page* 93)

line *C-D* intersecting the center line at *d*. Now take the distances *d-C* and *d-D* in the side elevation and place them in the pattern, measuring from the intersection on the center line *d* and obtain points *C* and *D*. At right angles to *C-D* erect the lines *C-c* and *D-e* equal to similar heights *c* and *e* in the side elevation. Now using *D-B* in the side elevation as a radius and *C* and *D* in the pattern as centers, intersect arcs at *B*, which is used as a center, with *B-d* as the radius, to describe the arc *c-d-e*. This arc intersects the previously erected lines at *c* and *e*. With a radius equal to *D-1* in the *true* length diagram, and *C* and *D* in the pattern as centers intersect arcs at *1*. Draw lines

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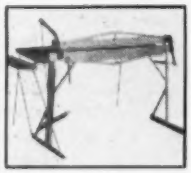

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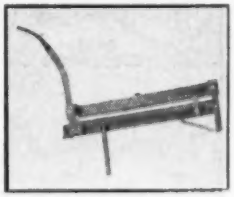

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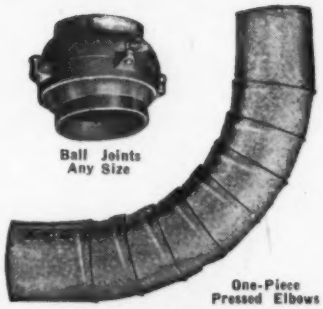

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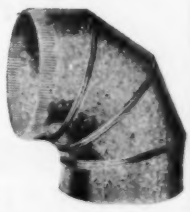

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from *1* to *C* and *D*. Now with *D-2* and *D-3* in the *true* length diagram as radii, and *D* in the pattern as center, draw short arcs at *2* and *3*. Set the dividers equal to the divisions *1-2* and *2-3* in plan and step off these divisions on the pattern from *1* to *2* to *3*. From these points of intersections draw lines to the apex *D*. Now with *D-4* in the *true* length diagram as the radius and *3* in the pattern as the center, draw the arc *4*, which intersects with an arc struck from *D* as the center, with a radius equal to *D-4* in plan. Draw lines in the pattern from *3* to *4* to *D*. At right angles to *D-4* draw the lines *D-e'* and *4-e''* equal to *D-e* and connect the points by the line *e'-e''*. In a similar manner obtain the left side of the pattern or trace the right side opposite the center line *B-1*, which will complete the one half net pattern shape.

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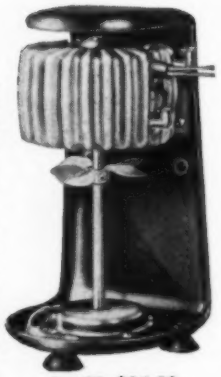

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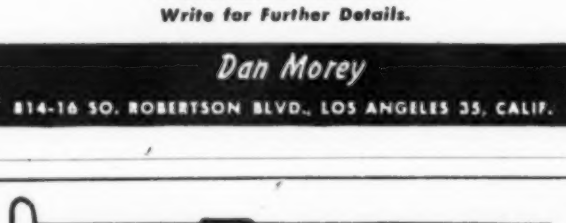

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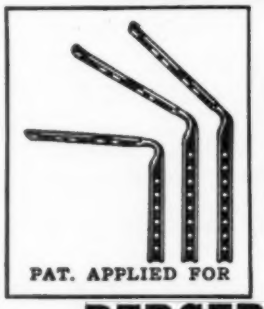

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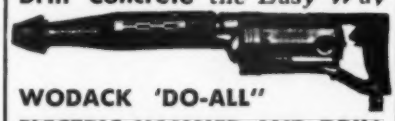

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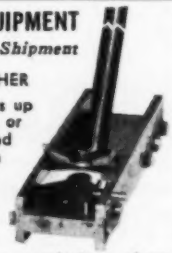

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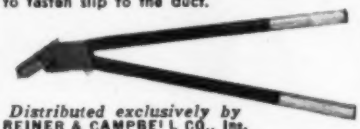

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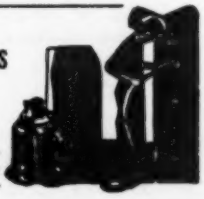

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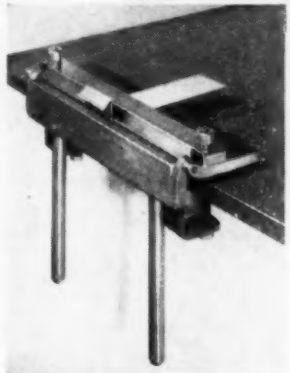

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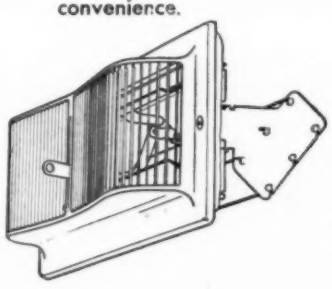

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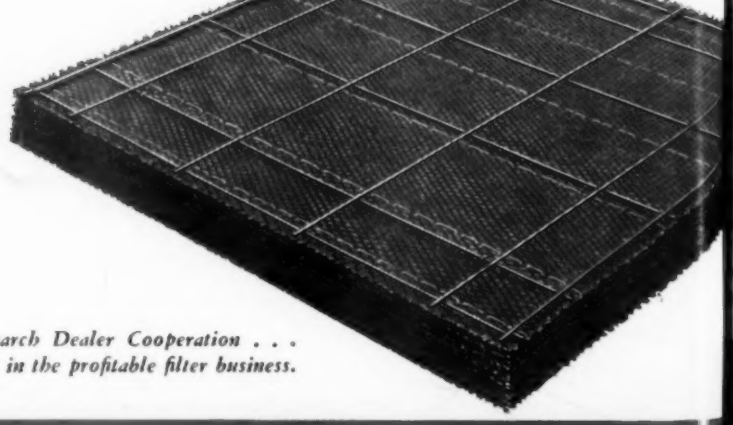

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